

VIRGINIA WILDLIFE

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ONE DOLLAR





Director's Column

William L. Woodfin, Jr



Virginia's Bobwhite Quail Management Plan

Quail have traditionally been Virginia's most popular upland game bird. The Virginia Department of Game and Inland Fisheries (VDGIF) has been actively managing and studying quail for several years, and now the Department has committed itself to an even greater effort.

VDGIF now has a comprehensive Quail Management Plan, and in the opinion of the experts, it is possibly the most comprehensive quail management plan in the country. All southeastern states face the same quail challenge Virginia does. We hope that our management plan will break new ground and suggest ideas that might be successfully put to work in other states.

All species management is a challenge. The status of quail is the result of complex factors, but one element that stands out is habitat. In this special issue of *Virginia Wildlife* you will find a straightforward and biologically sound approach to habitat. Almost all quail habitat in Virginia is on private land, and VDGIF

wants interested landowners to know their options for quail management.

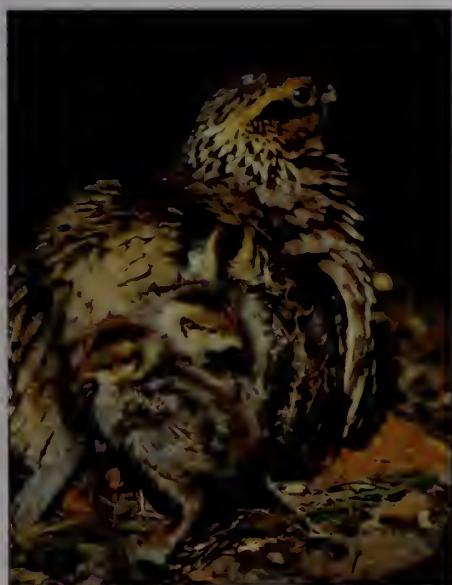
Our task is to further the interests of quail while pursuing a balance that comes when all wildlife flourish. Quail are the subject of this particular management plan, but several other species will benefit from sound quail management, and we think that will be of interest to all landowners.

You will read here about the excitement of a dog on point, that second when the hunter suddenly feels time suspended, just before a covey bursts into flight. And you will see what we hope to accomplish with the plan.

If you have questions, please contact us and we will be happy to send you a copy of the official Virginia Bobwhite Quail Management Plan. The plan is also available on our Internet Home Page at www.state.va.us/~dgif/index.htm. Look for the Virginia Bobwhite Quail Management Plan hyperlink in the contents.



VIRGINIA WILDLIFE



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Cover: Photos by Lynda Richardson.

Back cover: Many thanks to Virginia's private landowners, the key to our wildlife management success. Photo ©Dwight Dyke.

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Dedicated to the Conservation of Virginia's Wildlife and Natural Resources

THE PAST, A PLAN, THE CHA



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“Gotta point!”

called my hunting companion from just across the overgrown fencerow. If those words affected everybody as they do a quail hunter, they could be prescribed for the temporary relief of virtually every disorder known to man. The fatigue I'd felt only seconds before had vanished, painfully cold hands were suddenly ignored, and any depression I'd felt about not finding birds earlier, evaporated as I struggled across the wall of honeysuckle and moved to where I could see the dogs and try to be in a position to shoot when the birds flew.

LENGE



by Irv Kenyon

The thrill of a dog on point. The anticipation of a covey rise. The excitement of 15 or 20 bobwhite quail taking flight simultaneously. Can all this be in jeopardy? Does the current downward trend in bobwhite numbers threaten the enjoyment that quail hunting can bring. Will we even lose the opportunity to hear a "Bobwhite" whistle in the future? It's difficult to imagine, considering the not too distant past.

Looking back, I suppose we thought there'd always be an abundance of quail—those of us growing

up in the rural areas of Virginia 40 or 50 years ago. In those days, the spring and summer whistle of "Bob-white" was as common as fried chicken for Sunday dinner, and during the fall and winter, it seemed as though every idle field and overgrown fencerow had a covey of bobwhites in residence. Some change in land use was occurring, mostly a farm here and there being subdivided, but any impact of this on quail seemed minimal. Even for a youngster without a dog, it wasn't difficult to jump a covey of birds.

In the mid-1960s I moved to the eastern foothills of the Blue Ridge where I took up hunting quail to the exclusion of other game—and nearly everything else except bird hunting from November to February. By that time, a few long-time quail hunters in the area were grumbling that, "There's hardly enough birds left to break a dog." Relative to earlier times, I'm sure they were right in some instances. Urbanization, increased grazing, and intensified cropping were having an adverse impact on quail but this seemed to be of a mostly local nature. I, too, sensed some parallel between the age and physical condition of those hunters and their perception of the quail population. Personally, I thought quail populations were still pretty doggone good in the rolling terrain I hunted, and I suspect, throughout much of the rest of the Piedmont and Coastal Plain as well. It would be another decade or so before widespread and unmistakable declines in quail numbers began to surface.

Bob Gooch, a longtime Virginia quail hunter, recently wrote that quail hunting, "...held up well into the 1970s when their numbers seemed to begin [to] plummet." I couldn't agree more. Coming into the 70s much of Virginia's quail population was living in marginal habitat, caused by years of gradual, and often subtle, change in the landscape. Still, in the absence of any catastrophic event, populations were able to hang on and maintain reasonably good numbers. In the late 70s the hammer fell in the form of severe winter weather, two years

worth, back-to-back. Quail that had previously survived substandard living conditions either perished or were weakened to the extent that recovery to former numbers was not possible. Meanwhile, the continuing loss of habitat further diminished the chances for populations to bounce back. Left, in many instances, were isolated populations, far less capable of increasing or even maintaining their numbers than were the dense, widespread populations of years past.

A annual survey of quail hunter success in Virginia, begun in 1977, has confirmed what Bob Gooch and most other quail hunters across Virginia have observed. Statewide, quail populations have been heading downward, with scant pause, for nearly 20 years.

Thinking ahead, equally as serious as the decline in quail numbers is the decline in the number of quail hunters. Certainly attrition is taking its toll. For some hunters, the relative leisure of quail hunting in the past—on agricultural land—has now often turned to hunting clearcuts if they're to be successful at all. This, alone, might hasten a hunter's decision to quit. Adding to the problem, with interest in hunting in general on the wane, the poor success rate for finding quail probably makes this among the least interesting game to those just beginning to hunt. There's not a lot to offer new recruits.

With this occurring, I'm reminded of the lyrics of the country song lamenting the passing of established Grand Ole' Opry stars, "Who's gonna play the Opry? Who's gonna stand up tall?" If the number of quail hunters continue to decline, the strongest voices that have sung the praises of the bobwhite will continue to fade into the wings. Any reduction in hunter interest will make recovery efforts increasingly difficult.

The well worn saw, "Time is of the essence," may not be better applied than to the current situation we face. Biologically, quail cannot easily afford further depletion of their numbers. Neither can quail hunters afford further losses from their ranks.

What can be done? First we must recognize that good habitat, in sufficient quantity, is indispensable to sustaining any quail population. Let's put behind us, even in discussion, the tried and failed practices of predator control and stocking, and concentrate on those things that will provide habitat. While predators clearly impact quail populations, these have been with us as long as there have been quail. Additionally, indications are that a significant number of quail losses are to avian predators which are protected by a law that is not likely to change. New release techniques have rekindled interest in stocking. Even assuming improvements in release methods are as good as claimed, the establishment of a standing wild quail population will only occur where habitat allows.

By its recent approval of a statewide quail management plan, the Virginia Department of Game and Inland Fisheries has taken the lead in implementing various approaches that, if given wide application, will improve habitat. Vigorous support should be given to those strategies advanced in the quail plan.

Many local chapters of Quail Unlimited and other organizations and individuals are joining in. This is a beginning.

However, the ultimate success of "The Plan" will require the efforts of individual quail hunters and landowners, often working in concert, to produce habitat on a scale, and of a duration, that will provide meaningful and lasting benefits to quail. The Game Department or private organizations dedicated to quail cannot do it all. Nor is it realistic to expect private landowners, who hold virtually all the potential quail lands in the state, to also shoulder the entire burden of materials, equipment or manpower to put bobwhite management into practice.

And I'm not speaking of hunter/landowner agreements that necessarily allow hunting. Perhaps I'm being naive, but the only expected reward should be to produce a covey of quail where there is now none or add a covey to an existing population.

A few years back a gentleman from Halifax County, Jimmy Edmonds, who described himself as a quail hunter and country lawyer, proposed

a quail habitat improvement concept he called "Adopt a Farm." The idea encourages those interested in quail to seek permission and to implement quail management practices, where feasible, on a suitable farm. To my knowledge the idea has never been widely accepted or practiced. Dusted off, polished up and vigorously promoted, this concept could become a reality that would make a significant contribution to the success of the quail management plan.

Armed with information gained from Department wildlife biologists, bobwhite quail management workshops, from this issue of *Virginia Wildlife* and other sources, and from their own knowledge of "birdy looking cover," hunters and others interested in quail must now respond to the challenge to create and preserve quail habitat that will insure healthy bobwhite populations and bobwhite hunting for future generations.

Failure to move quickly and forcefully will only allow the decline of Virginia's quail population to continue, and the thrill of a point to be only an old bird hunters' distant recollection.

Irv Kenyon is a special projects biologist working out of the Ashland Field Office.



A staunch point is admired by women and men alike. The Department hopes to make this a common sight.



VIRGINIA'S BOBWHITE LEGACY

A History of the Bobwhite Quail and Its Management.

by Mike Fies

No other game bird embodies Virginia's rich Southern heritage like the bobwhite quail. A pair of well-trained bird dogs staunchly on point, a thunderous covey rise in a field of golden broomstraw, and the sound of a weathered double-barrel shotgun piercing the crisp morning air. These are the things that traditions are made of. Sadly, Virginia's quail hunting tradition is dying a slow and painful death in the Old Dominion. In response to declining populations, many long-time quail hunters have given up their cherished sport.

Those dedicated few who perpetuate the quail hunting legacy must often reminisce about the "good ol' days" to boost their spirits after disappointing days afield.

"What happened to all the quail?" is probably the most frequently asked question by Virginia sportsmen. It's a difficult question, but a fundamental one that must be answered if we ever hope to reverse the bobwhite decline. Much insight into the problems that quail currently face in Virginia can be revealed by looking at the bobwhite's rich and storied past.

Although many quail hunters might find it diffi-

cult to believe, the bobwhite is probably more abundant today than it was during precolonial times. When the first colonists reached Virginia's shores in 1607, the landscape was comprised primarily of mature woodlands that were generally not suitable quail habitat. Early accounts, perhaps exaggerated, described these forests as being so expansive that a squirrel could travel the entire length of the eastern United States without ever coming down from the tops of the trees or catching a glimpse of sunlight on the forest floor! Other descriptions of precolonial forests characterized them as park-like woodlands "so free of vegetation that a man could gallop a horse in any direction he wished, being halted only at rivers and creeks." Most of the trees in these cathedral-like forests were hardwood species, like oaks, hickories, chestnut, and beech. Their thick canopies obstructed nearly all sunlight from the forest floor, causing it to be almost bare of understory growth.

Less than one percent of precolonial Virginia was believed to have been open-land habitat suitable for quail. Most of these openings were created and perpetuated by native-American Indians through the repeated use of fire. Large areas were often burned for hunting purposes and for producing food for game animals. Smaller clearings were created around villages for planting agricultural crops. One of the most extensive cleared areas was called "The Barrens," extending northward from the Shenandoah Valley to southern Pennsylvania. This large grassland was more than 1,000 square miles in size and probably supported large numbers of quail. Although bobwhites were locally abundant in these cleared areas, the Indians rarely pursued them because of their small size and relative difficulty to bag.

As European colonists began to clear additional lands for agriculture, quail gradually became more plentiful. Using farming methods learned from the Indians, land was cleared by girdling trees and planting rows of crops between the standing trunks. Cropped areas were burned annually before planting and undoubtedly produced excellent habitat for quail. Other lands were also cleared to obtain timber for building houses and firewood.



Although quail were not yet abundant statewide, bobwhites were plentiful in the cleared areas occupied by early settlers. The first mention of quail in the "New World" was published by Captain John Smith in 1612. Other accounts in the late 1600s described quail, usually referred to as "partridges," as being "so plentiful and so tame that they come into the barnyards." In 1702, another author wrote that, "Partridges were numerous and tame. It is not an uncommon sight to see them eating with the chickens." Because quail were readily available and their meat was highly prized for food, colonists shot these "partridges" for table fare at every possible opportunity.

As cleared fields were planted repeatedly to the same crops, the soil eventually began to lose its fertility. Land was abundant and slave labor was readily accessible, so the common farmer took few measures to conserve fields with depleted soils. As old fields were worn out, new areas were simply cleared to replace them. Many additional acres of forested land fell to the early settler's ax. These newly cultivated areas were often located in close proximity to the abandoned fields, creating ideal conditions for quail.

As a result, the bobwhite became an increasingly abundant byproduct of pioneer agriculture.

Farming methods changed little during the early 1800s.

Eventually, the iron plow was introduced and animal manure was found to be useful as fertilizer. By plowing deeper and fertilizing the formerly infertile soils, many abandoned fields were gradually reclaimed for agricultural purposes.

Areas that had grown too thick for quail were restored to prime habitat once again.

With the abolition of slave labor following the Civil War, many lands were abandoned and large plantations were frequently subdivided into smaller farms. Most landowners in the Piedmont and Tidewater regions of Virginia were not accustomed to cultivating their own lands and commonly utilized the services of tenant sharecroppers. Under this system, tenant farmers generally took less care of the land than the landowner had done previously. Many abandoned fields were quickly invaded by broomsedge, ragweed, and native legumes that created favorable habitat for quail. Fencerows became increasingly unkept with briars and shrubs. The zig-zag pattern of the split-rail fences made them almost impossible to cut next to, and these areas soon grew

thick with excellent escape cover for quail and other small game. It was a time of plenty for the bobwhite and Virginia quail populations probably reached their peak during this period.

Market hunting was commonplace during the mid to late 1800s and was responsible for the near depletion of certain game species like turkeys and grouse. Quail populations, however, were relatively unaffected, even though large numbers were commonly sold in the open market. According to one Virginia writer of this day, quail continued to thrive despite being "snared, gunned, baited, trapped, hunted, shot at, and worried." It wasn't until 1885 that legislation was first passed in Virginia to protect quail. This law, which applied only to Piedmont counties, made it illegal to hunt, kill, sell, or buy quail from January 1 to October 15. A similar law that applied to the remainder of the state was enacted in 1904.

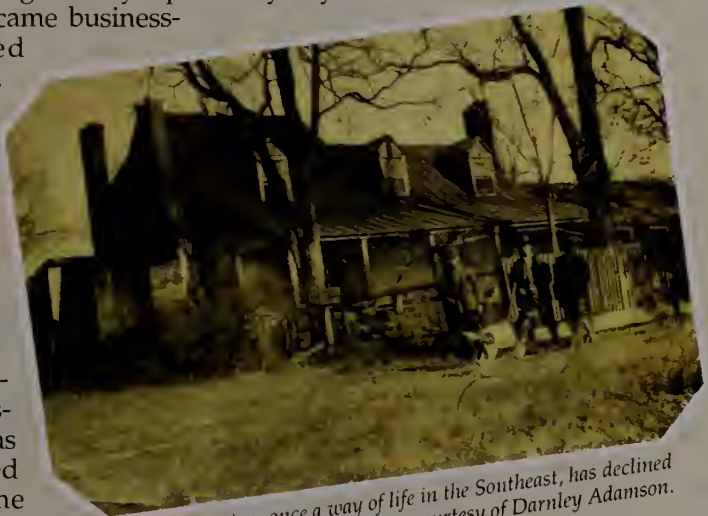
It was during this heyday that quail hunting became symbolic of Southern aristocracy. Hunting bobwhites was considered a sport of privileged southern gentlemen, even though many "Yankees" migrated South during the winter months to hunt on the larger plantations. Alexander Hunter, a wealthy Virginia sportsman of the Old South, emphasized the importance of quail hunting to the economy: "Plain, unpretending bobwhite furnishes at least one-half of the sport in both North and South today. Exterminate him, and every gun manufacturer in the land would fail; every ammunition factory would go to the wall... Not only this, but every kennel in the land, whose combined capital runs in the millions, would be broken up, and blue-blooded setters and long-pedigreed pointers would not bring the cost of their collars... Yes! a wonderful bird is the little brown-coated, shy partridge, who is as much the friend of man as the dog who hunts him."

Unfortunately, this quail utopia was short-lived. Landowners and sportsmen soon began to notice that quail numbers were declining. Ac-

cording to an early Game Department report, quail were delivered a particularly devastating blow just prior to the turn of the 20th century. This event was described as follows: "In February 1899, a severe snow storm swept Virginia. The snow fell to an average of three and one-half feet on the level, and for three weeks the thermometer was often below zero, and never much above. In 'Partridge' history, this was the 'Great Plague'. It almost killed the whole species..."

Although bobwhites possess the inherent ability to recover from such disasters, conditions were never again as favorable for quail as they were during the late 1800s. As the 20th century progressed, Virginia became increasingly urban and the amount of farm land decreased accordingly. At the same time, crop production increased on lands that were being farmed more intensively. A self-sufficient agricultural system, in which most crops were raised for a farmer's own use, was gradually replaced by a system in which farmers became businessmen who produced commodities for sale. Stiff competition from other areas of the country forced farmers to develop more efficient farming methods that generally had adverse impacts on quail numbers.

In its first annual report of 1917, Commissioner John P. Parsons of the newly created Department of Game and Inland Fisheries reported that quail populations in



Quail hunting, once a way of life in the Southeast, has declined along with the bobwhite; photos courtesy of Darnley Adamson.

Virginia were low and that action was necessary to bring their numbers back. Later that year, a quail breeding program was initiated and Virginia soon led the nation in the number of captive-reared quail produced. In 1922, 1,200 bobwhites were raised at the Game Farm and released on "sanctuaries" throughout the state. These "sanctuaries" included more than 100,000 acres of privately-owned land that the Department leased for a minimum of three years.

At the same time that bobwhites were being raised at the Game Farm, large quantities of quail were imported from other areas and restocked in Virginia. Most of these imported quail came from Texas or Mexico. According to Department records, 1,260 Texas quail were released in 1927 and 6,200 Mexican quail were released the following year. More than 10,000 additional Mexican quail were released in 1929. The cost of these Mexican quail was approximately \$2.00 each and officials soon realized that not enough birds could be purchased to significantly increase wild populations. Also, these Mexican quail were smaller in size, did not overwinter well, and were considered to be less "sporting" than our native bobwhites. To this day, many long-time hunters who kill an undersized quail (usually a late-hatched juvenile bird) mistakenly blame their experience on the genetic influences of Mexican quail that were stocked nearly 70 years ago!

By the 1930s, efforts to restore quail were once again focused on the propagation of pen-raised birds. In 1931, the Department's policy was to stock pen-raised quail only on areas that were closed to hunting for one year following the release. For the first time, game managers also began recommending habitat improvements, particularly the establishment of Korean lespedeza field borders to improve food resources. According to a Department report, game wardens distributed approximately 15,000 pounds of Korean lespedeza seed to interested landowners in 1932.

Private individuals also began to rally behind the Department's efforts to save quail. Mr. G. B. Collins of Newport News offered a \$1.00 reward for each quail nest that was saved in a harvested field. The reward was only paid if the saved nest subsequently hatched, a determination that was made by the local game warden. Records show that Mr. Collins paid about 260 claims for "saved" nests.

Despite these valiant efforts, quail populations in Virginia continued to decline. To counteract these losses, the Department devised a plan where even more quail could be released throughout the state. Pairs of adult quail were distributed as brood stock to anyone who agreed to release all birds that were raised into the wild. Clutches of eggs were also distributed as part of the plan. The results of this program were disappointing; only 184 adult birds and 28 clutches of eggs were distributed statewide.

During the early 1940s, biologists began to seriously question the value of stocking pen-raised quail. Areas where large numbers of quail had been released seem to have no more birds than unstocked areas. Soon it was the general consensus that stocking pen-reared quail into unoccupied areas did not result in the establishment of new populations, usually because habitat conditions were sub-optimal. Furthermore, stocking birds into favorable habitat was deemed unnecessary because it was believed that native birds would colonize these areas. As a result of this change in philosophy, the number of quail produced at the Game Farm gradually declined. Soon, quail propagation efforts were abandoned in favor of experimental work with exotic game birds like pheasants and partridges. When it was all said and done, more than 100,000 pen-raised quail had been liberated throughout the state without satisfactory results.

During the late 1950s, the never-ending search for a "better" game bird led the Department to experiment with the Coturnix quail (also known as the "button quail" and

"stubble quail"). A native of Asia and Europe, its principal attraction was a high reproductive rate. Hens were said to lay between 150 and 200 eggs per year and two generations of birds could be raised in captivity during a single season. Enthusiasm for this species was high among sportsmen throughout the United States as sporting magazines heralded the arrival of a new quail era. In 1956, Virginia purchased 25 pairs of Coturnix quail from the Missouri Department of Conservation. More than 2,800 young were produced at the Game Farm during the first laying season. By 1957, Coturnix quail had been released in every county in Virginia. The experiment quickly turned out to be an expensive embarrassment, however. The Coturnix quail, known to be migratory in their native range, quickly scattered to the winds after release. Banded birds released in Virginia were recovered in North Carolina, South Carolina, Georgia, Pennsylvania, and Ohio! Needless to say, the Game Department's fascination with Coturnix quail was short-lived.

As the futility of restocking quail became increasingly apparent, game biologists began to focus on improving habitat as the best way to increase bobwhite numbers. Unfortunately, this was no simple task, since Virginia's agricultural landscape had been drastically altered during the first half of the 20th century. Changing land use patterns and increased farm technology resulted in the loss of many acres of formerly good quail habitat. Farms that were once typified by a diverse assortment of small crop fields had been gradually transformed into large fields of intensively managed monocultures. Tractors and bulldozers were now commonplace and allowed for the easy removal of fencerows that hindered the use of large farm machinery and did not fit the desired image of a "clean" farm. The removal of these fencerows also resulted in the loss of important escape cover, nesting habitat, and travel corridors for quail.

Quail numbers also declined in response to the increase in cattle pro-

duction that took place during this period. The rough pastures and fallow fields formerly used for grazing purposes were "improved" by planting sod-forming grasses like fescue. Fields that were converted to fescue could be grazed much more intensively, but offered little in the way of nesting and brood range habitat. The conversion of large acreages of pastureland and worn out crop fields to fescue was one of the most devastating changes to affect quail during the 20th century.

During the 1960s and 1970s, things only got worse for the bobwhite. A rapidly expanding human population continued to encroach into agricultural areas. The farm economy dictated that every available acre be cropped as efficiently as possible and little concern was given to the needs of wildlife. Technological advancements in farm machinery allowed more acres to be harvested with less "waste." Improvements in mowing equipment, particularly the introduction of the bushhog, enabled farmers to clear brushy areas that quail had used as escape cover. Other modern farming practices, like fall plowing, double cropping, the reduced use of fire, and an increase in the use of pesticides also had detrimental impacts on quail numbers.

Although biologists recognized the changes that were taking place, there was little that they could do to reverse the disturbing trends. Without an economic incentive to produce quail habitat, few farmers were interested in spending the time or money to manage their lands for bobwhites. Department personnel began to focus their technical assistance efforts on areas where landowners had a specific interest in quail and were likely to follow their management recommendations. More emphasis was also placed on educational efforts to promote cost-efficient quail management practices on working farms. Public-owned wildlife management areas

were used to demonstrate techniques for increasing quail numbers.

Despite the best efforts of dedicated wildlife professionals, the decline in Virginia's quail population accelerated at an exponential pace. The statistics were alarming; U.S. Fish and Wildlife Service data showed that the number of quail heard calling on breeding bird survey routes declined 48 percent from 1966 to 1980. Quail hunters became increasingly concerned and the Virginia Quail Hunters Association was chartered in 1982. In 1986, this group became the first Virginia chapter of a new national organization called Quail Unlimited. Other chapters sprang up throughout the state, and the Department began working closely with Quail Unlimited on a variety of quail management projects. In 1988, the Virginia General Assembly became involved and established a Joint Subcommittee to study the quail decline (House Joint Resolution 114, The Decline of the Bobwhite Quail). Their report to the Governor, published in 1989, was the first major effort to develop a comprehensive quail management plan in Virginia.

A great deal was accomplished in the years to follow, with particular emphasis placed on education and technical assistance. Numerous quail management publications were developed and workshops on controlled burning, warm season grasses, and habitat management were held around the state. Technical assistance was available for anyone who asked and an unprecedented number of site-specific quail management plans were written

for landowners. Research efforts were also expanded and knowledge was gained on the effects of chemical pine release on quail habitat, the impacts of different disking dates on quail food production, and bobwhite nesting ecology.

These efforts were still not enough, however, and quail populations declined to record-low numbers in 1994. Frustrated quail hunters found little consolation in the fact that every other state throughout the Southeast was experiencing similar problems. The Virginia Department of Game and Inland Fisheries had a history of being a leader in the wildlife management profession and the Board expected staff to do more. As a result, an ambitious five-year Virginia Bobwhite Quail Management Plan was developed in 1996.

The bobwhite quail has enjoyed a rich history in the Commonwealth. Only by understanding the problems of the past, can we hope to preserve quail for the future. This task is not only a tremendous challenge for sportsmen who cherish this noble game bird; it's a responsibility that everyone who loves wildlife must be willing to accept. □

Mike Fies is a small game research biologist working out of the Verona Regional Office.



A Road Map for Quail Restoration

The Virginia Bobwhite Quail Management Plan



Lloyd Hill

by the Virginia Quail Plan
Committee

Have you ever driven around for hours with your hunting buddy looking for that farm you were supposed to hunt when he commented, "It sure would be nice if we had a map!" Charles McDaniel, Department of Game and Inland Fisheries'

Board Chairman wanted to make sure he found the "farm" when he requested that the staff, "Tell us what it is going to take to turn around the quail decline—money, equipment, and manpower." He wanted a good road map to steer the agency down the quail restoration highway.

The road map that was developed is now known as the Virginia

Bobwhite Quail Management Plan. It started with the agency bringing together five biologists with almost 100 years of small game management experience between them: Mike Fies, Small Game Research Biologist, Verona; Irv Kenyon, Special Projects Biologist, Ashland; Patty Moore, Farm Habitat Biologist, Powhatan; Pat Keyser, District Biologist, Farmville; and Steve Capel,

Farm Wildlife Supervisor, Powhatan. They began meeting with quail hunters, folks that work in Virginia forestry and agriculture and with quail biologists in other southeastern states.

A lot of questions were posed. At times we probably sounded like an inquisition: What do you think are the main problems quail face? What has worked for you? What has not worked? What could you do to assist us in restoring quail numbers? We also decided to survey all states (32) with bobwhite populations,



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Increased technical assistance for landowners is available. Publications and videos are available on warm season grasses, timber and general quail habitat management.

asking many of the same questions: what they were doing for quail, what was working, and what had proven unsuccessful. We wanted to make sure that we did not overlook any practices that had been working to improve quail numbers elsewhere. Soon a dozen problems were identified.

The next task was to identify strategies to solve each problem. What worked in other states? Of these approaches, which stands the best chance of working in Virginia? Do we have any unique opportunities or hurdles?

Strategies to address the various problems began to take shape and fall into place. The more important problems and the strategies that seemed the most promising in solving these problems are detailed in the following summaries:

“Quail” Pines

From the broad sandy plains bordering our coastal marshes, to the rolling red hills below the Blue Ridge Mountains, bird hunters in the Commonwealth are familiar with pine plantations. And well they should be. Between 1986 and 1992 the acres of pine plantations increased by 25 percent to 1.5 million acres. This is about the same amount of land planted to corn and soybeans combined—in the entire state. Keep in mind that the pines are concentrated in the eastern half of the state only.

To some, all of this planted pine is bad news. To quail it could be great news. Now anyone who has ever followed a setter through a two- or three-year-old planting of pines doesn't need a lot of convincing about the good news. But Game Department biologists weren't looking at these young pines when they focused their attention on the subject in the Quail Plan. They looked instead at the incredible potential that nearly one million acres of maturing pines could have for quail habitat.

In the next decade nearly two-thirds of our plantations could be thinned for pulpwood. While this increases the profit received by the landowner, it also can be a windfall to wildlife. The increased sunlight reaching the forest floor after a thinning results in a flush of new vegetation. A heavy enough thinning combined with prescribed understory burning can transform this new vegetation into high quality quail habitat.

The challenge in the Quail Plan is to first make forest landowners aware of the economic benefits of heavier thinnings in their pines. Studies seem to show that thinnings heavy enough to benefit quail and other wildlife may actually give a better return to landowners than the more conventional lighter thinnings. This is because at the lower densities larger trees can be grown; and larger trees have higher value per unit of volume. To realize the benefits for both economics and quail, it would not be necessary to thin nearly as heavily as the classic Southern quail plantations.

A second challenge is helping these landowners become familiar with understory burning. But that will be dealt with through another strategy in the plan. The approach on the pines themselves is two-fold. First, the Department is hoping to join forces with the Department of Forestry to conduct a more thorough study of the economic return of various thinning regimes. Secondly, a substantial effort will be made to educate landowners with what we already know about this subject. A three-pronged approach featuring demonstration areas, videos (and brochures), and workshops will be used to get the message out.

And who knows, with a little bit of luck and a whole lot of work, this effort may make 20 percent of the pine plantations quail habitat. Simple math puts that at about 200,000 acres! Not a bad contribution to the cause.

Heating Up the Habitat— Prescribed Burning

Fire is among the most valuable and cost efficient tools available for managing bobwhite quail habitat yet is probably the least understood. Burning established vegetation, it might seem, would be the last thing to do when vegetation is exactly what bobwhites rely on throughout the year for cover and food.



(Top) Pine thinning, followed by controlled burning provides habitat for quail, deer, and turkey.
(Above) Controlled burning of open areas is another excellent quail management tool.

When prescribed for quail habitat improvement, fire is used in a well controlled manner. A prescribed burn removes vegetation from only part of the total area. Additionally, the recovery of burned areas is swift and the resulting new vegetation and conditions on the ground are much more "user friendly" for quail than before.

The benefits of controlled burning are four-fold: 1) it reduces plant litter, the accumulation of which makes walking and food finding difficult for quail; 2) it controls woody plants; 3) it releases dormant seeds, often those of plants important as quail food producers; and 4) it increases the number of small insects, attracted by tender, new vegetation. A summer diet high in insects is vital to the welfare of nesting hens and newly hatched quail chicks. To

encourage the use of fire by landowners interested in improving quail habitat, the quail management plan includes: conducting prescribed burn workshops; equipping trailers with safety equipment and prescribed burn tools, and making them available to landowners; and entering an agreement with the Virginia Department of Forestry to work cooperatively on burn workshops, technical issues and equipment needs.

Native Warm Season Grass

One of the challenges quail face in Virginia is the continued increase in cattle production. This trend led to an increased use of cool season grasses, especially fescue. Fescue does not produce the vegetative structure required by quail and is no longer thought to be as good for cattle as it once was. It produces a thick mat of dense vegetation that inhibits free movement of quail and their broods. Quail need to be able to move around easily and still have overhead protection from avian predators. Native grasses can provide this cover.

Native warm season grass, as used here, refers to a group of bunch grasses that grow vigorously during the summer months, even during periods of extreme drought. They are also adapted to growing in poor soils. Examples include switchgrass, indiangrass, big bluestem and eastern gamagrass. These grasses are very palatable forage for cattle and can be used in a rotational grazing system to fill the summer forage void. In addition, these grasses provide excellent cover for quail and other grassland birds. These grasses are superior quail cover because they grow tall, remain upright even after snows and grow in clumps with room between the plants. These qualities are important because quail spend the majority of their life on the ground foraging for food.



The Department of Game and Inland Fisheries is encouraging landowners to use native warm season grasses through the Virginia Bobwhite Quail Management Plan. The goal is to convert up to 20 percent of the cool season pastures and hayland in Virginia to warm season grasses. The Department is offering cost share assistance for eradicating fescue and establishing these grasses through the Best Management Practices (BMP) Program administered by the local Soil and Water Conservation Districts.

The Department will also assist in establishing at least one 10-acre field of warm season grasses per county for demonstration purposes on working cattle farms. The field will be used in a rotational grazing system or for haying. The Department will provide the technical assistance needed to establish and manage these grasses properly. The demon-



world of the bobwhite quail is certainly no exception.

Although a wealth of knowledge has been gained since Virginia's first quail research project was completed in 1937, much remains to be learned about this fascinating game bird. Times have changed, and most of the fine early research that was conducted on this species was done in habitats that only faintly resemble our modern landscapes. As a result, wildlife biologists are having to re-examine many of the established principles that our current state of quail knowledge is based upon. Virginia's five-year quail management plan helps identify some of the more important research questions and proposes strategies for obtaining answers.

An initial first step in managing any wildlife population is to develop a reliable population census technique. Knowing whether a population is increasing or decreasing is critical for measuring management success. Currently, Virginia's quail population is censused annually using spring call-counts, a rural mail carrier roadside survey, and a quail hunter cooperator survey. Unfort-

strations will be featured on conservation field tours and workshops.

Three native warm season grass workshops will be held annually at various locations around the state. Workshops will cover establishment and management of warm season grasses and include a field trip to look at some established stands. The workshops will be open to land managers, conservation resource professionals from state agencies, federal agencies, and private industry.

Specialized equipment is necessary for planting indiangrass and big bluestem which have chaffy seeds. Switchgrass can be planted through a legume seedbox and eastern gamagrass can be planted with the same equipment used for planting corn. Two specialized no-till drills are available to landowners through the Virginia Department of Game and Inland Fisheries for

planting native warm season grasses. The Department will purchase two additional specialized drills within the next couple of years. It will also provide funds for adapting Soil and Water Conservation District drills so they, too, can be used for planting warm season grasses.

Bobwhite Quail Research

After studying bobwhite quail for more than 60 years, one would like to think that wildlife biologists know everything that they need to know about quail. In fact, the bobwhite quail is often referred to as the most studied bird in America. But like the old adage says, "the more you learn, the less you really know." Nature is exceedingly complex, and understanding the complicated



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(Above left) Quail research is the first key to proper management. Here, a male is fitted with a remote tracking transmitter. (Above) One important aspect of our Department research was determining causes of nest depredation.

nately, the sample size for these surveys is inadequate in some regions. Several of the quail plan's strategies propose methods for bolstering participation rates in areas with insufficient survey representation.

The quail plan also calls for the development of a system to accurately monitor changes in the avail-



Quail and agriculture can go together. Grain left over from harvesting operations is an important winter food source for many bird and mammal species.

ability of suitable quail habitat. Research is being contracted with Virginia Tech to investigate the feasibility of using satellite imagery to identify and map quail habitat on large areas. A computerized geographic information system will then be developed to quantify the availability of quail habitat statewide. This information can be used to accurately monitor the effects of changing land use patterns and habitat management programs on bobwhite populations. Areas with the most critical habitat deficiencies can be identified and targeted for management emphasis.

Deteriorating habitat conditions have caused many biologists to re-examine their beliefs about the impacts of predation and hunting on quail populations. In the quail plan,

research is proposed to determine the effects of reducing mid-sized furbearer populations (skunks, opossums, raccoons, and foxes) on quail recruitment. This cooperative project with the North Carolina Wildlife Resources Commission and North Carolina State University will begin this year. Another multi-state research project that addresses the effects of hunter harvest on quail populations is planned for 1999.

For the past three years, the Department has been conducting a large-scale bobwhite quail nesting ecology study. By intensively monitoring more than 400 radio-collared quail during the breeding season, much has been learned about bobwhite nest success, brood survival, and adult mortality. To better understand the data collected in this study, the plan proposes the development of a quail population model that will identify the relative importance of

individual population parameters. Management efforts can then be focused on those factors which most strongly contribute to population declines.

The bobwhite quail plan also recognized the need for additional information on the impacts of pesticides on quail. Research is planned to determine exposure rates of Virginia quail to agricultural chemicals using hunter-submitted wing samples. Follow-up research will then be conducted to determine the direct and indirect effects of these pesticides on adult survival, reproductive success, and chick survival.

Information is also lacking on the effects of releasing pen-raised quail on wild populations. More specifically, little is known regarding the general health of quail raised by commercial breeders and the frequency that diseases are introduced into wild populations. The quail

plan proposes research to develop a monitoring system for disease problems in pen-raised quail and for testing exposure rates of wild quail to diseases commonly associated with pen-raised birds. This research will be conducted on field trial areas and shooting preserves where large numbers of pen-raised birds are commonly released.

Even though our knowledge of "Gentleman Bob" is clearly incomplete, we must not wait for all the answers before action is taken. Understanding nature is a challenge that man has endured since the dawn of time. It's unlikely that we will ever have all the information that we'd like to have. Only by asking important new questions and effectively using the knowledge that we already have can we hope to reverse the decline of bobwhites in Virginia.

Rights-of-way Management

Think of the potential. There are over 300,000 acres of highway rights-of-way (ROW) alone in Virginia—not to mention power distribution and transmission lines, pipelines, and similar lands. These rights-of-way cross numerous properties and have the chance to influence habitat on literally thousands of farms. Almost every tract of land in Virginia has some form of utility crossing it or delivering service to it.

On top of that, rights-of-way are linear, and consist almost entirely of edge, a vital component of quail habitat. Edge habitat connects habitats and offers a transition between habitat types.

The Quail Plan recognizes these opportunities. Two specific areas offer promise: 1) planting the rights-of-way to appropriate quail habitat to begin with and 2) adopting a management scheme that produces suitable quail habitat and is economical for the utility or highway department.

The Department is already working with many utilities. Virginia Power, for example, is utilizing a va-

riety of plant materials that are attractive to quail, such as switchgrass, Korean and kobe lespedeza, orchardgrass and ladino cover on their new lines. They even use bicolor (VA70) lespedeza on the shoulders of some of their transmission lines.

Years ago Delmarva Power began using low-volume, selective herbicides to kill taller-growing trees while leaving the herbaceous grasses and legumes untouched. Other utilities are beginning to use this approach in one form or another as a part of their maintenance in place of the more expensive mowing of entire ROWs every three years. Mowing can be quite disruptive to quail nesting and brood rearing. Thus herbicides are being used constructively in a form that ends up being a quail management tool.

Often times it is a matter of public acceptance of these new approaches that is the obstacle. For example, VDOT maintenance personnel recognize that limiting mowing reduces maintenance costs significantly, but phone calls saying that the ROW looks "messy" or unkempt often results in starting up the mowing machines. A simple sign that denotes "Unmowed Wildlife Cover" would inform passing motorists that this was an intentional action, not neglect.

The Quail Plan anticipates the Department working with utilities on both the planting and maintenance aspects to insure that they all are aware of these methods that are proving economically and environmentally friendly.

Target Counties

In order to concentrate quail habitat development efforts and to be able to measure changes in quail numbers, 75 percent of the BMP Wildlife Option funds are targeted at these nine counties: North Tidewater: King and Queen and King William; North Piedmont: Orange and Spotsylvania; South Piedmont: Amelia and Halifax; South Tidewater: Southampton, Surry, and Sussex. This will give biologists samples

from all four major quail regions, and a chance to assess how practices are working in the different regions.

USDA Farm Programs

Quail and agriculture have been inseparably intertwined across Virginia landscapes for almost 400 years. Agricultural trends have often directly impacted quail populations. In the 1940s and 50s the declining tenant farming brought a shift to large-scale livestock operations, and the resultant search for improved forages. Every few years another "wonder forage" appeared on the horizon. Unfortunately for Virginia quail, the one most Virginia farmers fell in love with was tall fescue. The recent return of cotton to prominence in Virginia does not bode well for our quail either! On the other hand, if more Virginia farmers switch to no-till crop production, this could result in improved quail habitats.

There is no other area that can yield more benefits for quail than working within the agricultural community to help shape policies and attitudes toward wildlife. For example, federal farm programs impact more acres by far than any other program or group of programs. Almost every tilled acre in Virginia is impacted by these programs. In recent years wildlife is receiving more attention in these programs.

The Quail Plan intends to increase the voice for wildlife in the Virginia agricultural community. Efforts will be made to incorporate wildlife considerations into Farm Bill rules and regulations at the national level, at the state level as programs are formulated and reviewed and at the county level as Soil and Water Conservation Districts meet to identify natural resource problems and formulate strategies to solve them, and through increased work with individual farmers. This work will include providing quail habitat management advice, development of various quail habitat demonstration sites in each county, and other landowner assistance.

You Have Questions? Biologists Have Answers

Technical assistance—the answers to how, when, where and why—though not a defined strategy, is a vital part of the quail management plan. Biologists across the state are available to help landowners and others with whatever questions may arise in planning or implementing practices to benefit quail or other wildlife. And the old adage that, “There’s no such thing as a dumb question,” certainly applies to wildlife management. Technical assistance can be as simple as a brief answer given over the phone. In other instances a visit to the property may be called for before satisfactory recommendations can be made. Assistance requested may be the source of a bag of seed needed yesterday, or it may involve extensive and long-term objectives. Technical assistance also includes providing printed material, or sources from where material or additional information is available. Quail management workshops and the establishment of demonstration areas are other forms of technical assistance that will be available to those interested as implementation of the quail management plan progresses. Your wildlife biologist may not be able to answer all your questions but in all likelihood he or she will be able to give you sound direction on where to find the answer. Have questions? Give your closest Department of Game and Inland Fisheries office a call. Our wildlife biologists have answers.

For more information, contact one of the following offices: Richmond Office at (804) 367-1000; Ashland Field Office at (804) 752-5502; Farmville Field Office at (804) 392-9645; Powhatan Field Office at (804) 598-3706; or the Verona Regional Office at (540) 248-9360.



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A large part of a wildlife biologist's job is responding to the questions of interested private landowners.

The Road Map

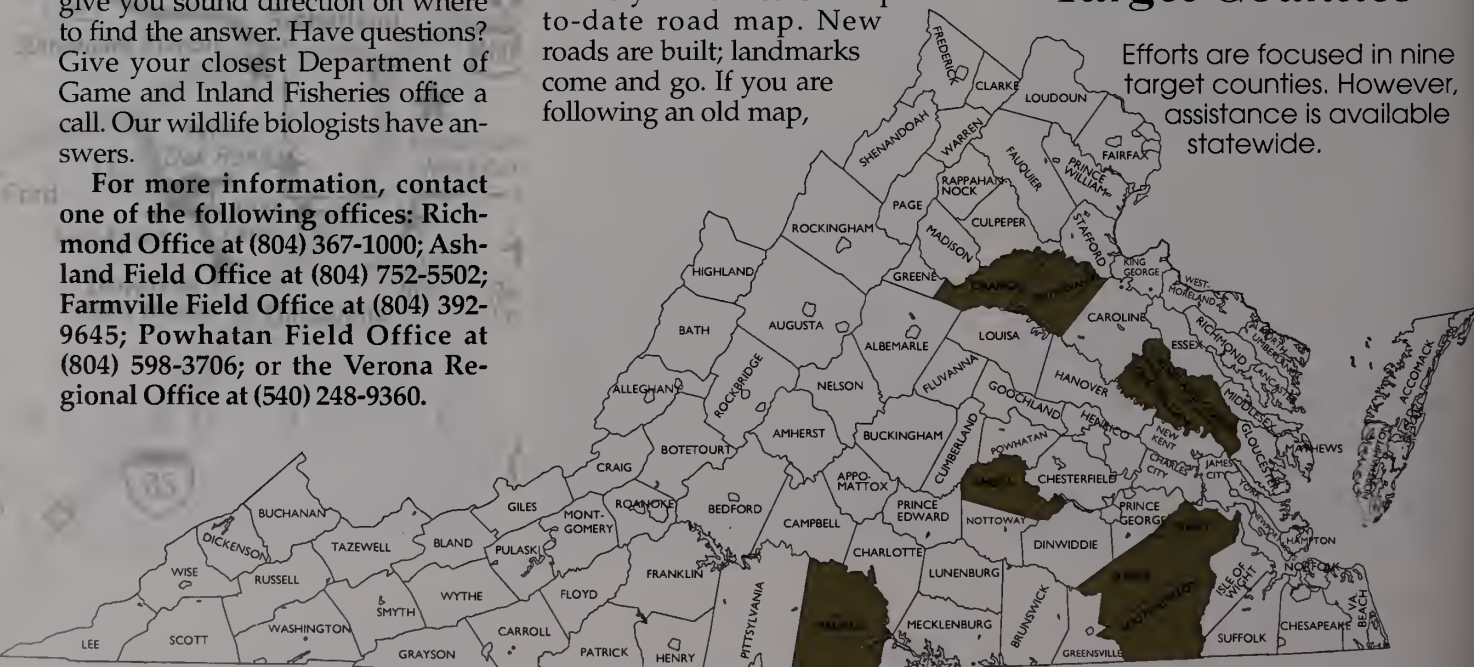
The Quail Plan set a plan horizon of five years to turn around the quail decline. The cost of each strategy was calculated and the extra equipment and manpower needs were identified. Several hundred plans were circulated for comments; public meetings and discussions with various groups were held. Response indicated that we were about on target, with a few minor changes in approach suggested. The final plan was unanimously adopted by the Board of Game and Inland Fisheries in April, 1996.

Every driver needs an up-to-date road map. New roads are built; landmarks come and go. If you are following an old map,

pretty soon you've missed a turn. The Department and Virginia quail enthusiasts now have an up-to-date road map. In time it will need to be revised as we find that some strategies have worked well, and others didn't work or they only worked in some parts of the state. This plan should serve well as a road map for sportsmen and the Department on the journey to halt the decline of quail in Virginia. □

Target Counties

Efforts are focused in nine target counties. However, assistance is available statewide.



A Year in the Life of a Bobwhite Covey

by Marc Puckett



The hunter stands on a weathered knoll overlooking the cutover lands and field edges he and the dog just covered. Though still up, the sun is fast sinking toward the western horizon. They stopped early. There were enough points today to keep him happy, and the dog got to retrieve. There was no reason to push it. No, they would just sit here and wait to hear the covey calls. He knew they needed time to regroup. It was going to be cold tonight and they would need each other for warmth. The sound of the first calls brought a good feeling to him. These coveys held a special place in his heart. He was content to sit here, rubbing his dogs ears, pondering the mysteries of his favorite bird.

Individuals in quail populations are short lived. They are hatched; they live; and most die prematurely. If they're fortunate, they accomplish their most important task—successful reproduction. Thus the life of an individual

quail is linear in the sense that there is a predictable end, much like an annual flower planted in spring—whose life as an individual is over with autumn's first killing frost.

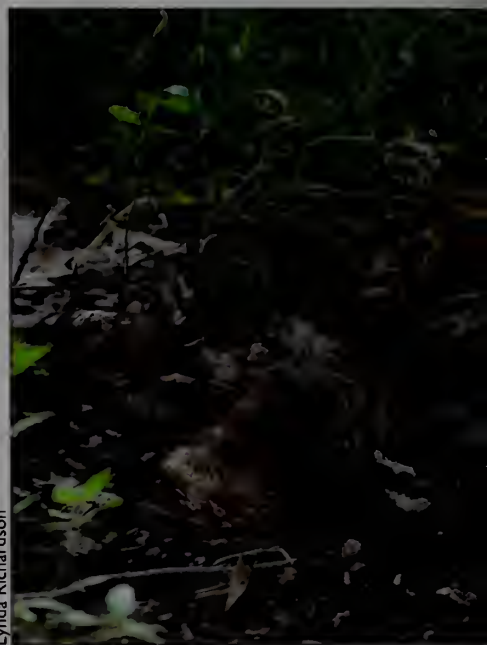
Populations, however, are often long lived and circular in nature. Though most of the individuals comprising a quail population change from year to year, the population itself continues as long as surrounding conditions are suitable. The population undergoes periods of ups and downs. Weather, changing habitat, predation pressure—all these and more influence the year to year number of individuals in a population. The population continues on. With no cognizance or self recognition, it progresses, fluctuating above and below a seldom realized "average number." If conditions deteriorate on a regional scale, like what we've seen in the Southeast, the average number declines. This is the bobwhite decline that we've all witnessed over the past 30 years.

Though bobwhite quail (*Colinus virginianus*) populations have declined throughout most of their range, local populations in some areas still flourish.

The ecology of the remaining populations is

fascinating. One of the most interesting aspects of this Galliform (chicken-like birds) is the quail covey. The covey is the unit of measure that bobwhites are famous for. Coveys are considered the smallest of bobwhite "populations," each being the population of a given covey range. Bobwhite coveys are "born" in autumn.

As day length decreases, the reproductive activity of bobwhites decline. By the end of October, quail breeding activity is over. The only possible event yet to occur would be a rare late hatching. Most coveys have formed. The adults that aggressively fought over mates and would not toler-



Lynda Richardson



Jack Colbert

(Page 19) Quail chick huddling with its parents, a critical aspect of their "youth". (Top) Bobwhite male enjoying a moment of rest. (Above) Quail huddling on a chilly morning. (Below) Quail huddling on a chilly morning. (Below) Quail huddling on a chilly morning.



usually large, from 14-20 birds. Winter's harshness and the full force of predation have not been felt. It's yet a time of plenty. Insects, critical to the development of chicks in summer, are still available for the older fall birds. Many legumes have dropped their seeds and waste grain from crop harvests is abundant. Cover, though thinning, is ever present and unharvested grain fields still provide travel corridors.

As are most times of plenty, these are short lived. With November comes killing frosts and the loss of most insect prey. The cold fall rains remove remaining leaves and the farmers have hustled in nearly all the soybeans. Nights become cold and cover scarce. If proper cover conditions can't be found, coveys will move in search of a new home.

Some coveys are secure. They are the lucky ones who live where active quail management occurs. They inhabit farms where rows of grain were left unharvested along brushy field edges just for these little birds. Hedgerows of shrubs supplemented with legumes and grasses were planted. Fields were not hayed right up to the woods edge and fescue pastures were converted to warm season grasses. The taller timber edges were cut back and daylighted providing good brushy winter cover. Windbreaks were planted on the northern edges of brooms-

edge fields to shelter roosting coveys from January's wind and provide travel corridors.

Each covey will inhabit a "headquarters" area. It might be a slash pile in a cutover corner or a hedgerow jutting into a bean field. It is the core of their home range, providing all their winter needs. Night finds them huddled together in broomsedge and blackberry cover tail to tail in a tight group known as a roosting disk. They rely on each other for warmth and group detection of lurking predators.

The first hint of morning light finds them still huddled, but soon to feed. One bird in a covey will sound the loud and clear covey call "k-a l-o-i h-e-e ..., k-a l-o-i h-e-e," serving to mark their territory and orient lost quail. As soon as the sun begins to warm the ground, they're off to feed. The covey maneuvers through their feeding areas seeking out waste grain, native ragweed, lespedeza, partridge pea, and pokeweed seeds or food plots planted with milo and corn. They're usually not far from good escape cover—those blackberry and honeysuckle thickets. Providing feeding and escape cover in close proximity is critical. Afternoon finds them back in their headquarters area loafing, preening, and dusting. They may huddle if the day is windy and cold.

February evenings find them busily feeding. Unlike many animals, quail don't build up large fat stores.

They need to feed every day,

ate other quail near their nesting site only weeks before, now join together again. They will depend on each other for survival. Coveys are typically comprised of adult birds and their broods. Sometimes it's one large "family"; other times it's a joining of 2 or 3 successful adults and their broods and a reproductively unsuccessful straggler, or two. The "young of the year" in a covey greatly outnumber the adults. Typically, only 20-30 percent of hatched quail survive longer than one year.

Coveys at this time are



preferably twice a day. They can survive without food a day or so if conditions are favorable, but inclement weather depletes their energy reserves, forcing them to feed to last out the cold nights. Birds separated from their covey will perish during cold rains or snowstorms. The quicker a covey can feed, filling their crops with oil and protein rich seeds, the better off they are.

March brings several changes. The lengthening days trigger the onset of the quail breeding season. Like most species of wildlife, quail breeding behavior is driven primarily by photoperiod (day length). Minor fluctuations in breeding activity are often caused by weather and moonphase. Though the covey remains close, with each bird still dependent on all the others for surviving cold nights, there is some antagonism developing. Bobs will soon fight over hens and many hens will choose mates before the covey deteriorates. Increasingly, the covey will fragment into smaller groups during the day, but may regroup on cold nights.

The once large coveys are now much smaller. Winter weather, predators, and hunters have chipped away at the large fall coveys. Spring coveys typically number from six to eight birds. These are lean times. Many agricultural waste grains have softened and lost much of their nutritive value. The harder, longer lasting native seeds, particularly pokeweed and partridge pea, are particularly important now. Cover is ragged, having been battered by winter storms. Quail are particularly susceptible to predation now. Having to feed longer in areas that lack durable cover makes life for many coveys perilous.

By late March or early April the familiar "bob-BOB-WHITE!" three syllable mating call (generally only the last two syllables are heard) of the male signals the official beginning of the breeding season. By late April, most coveys have dissolved. Mated pairs are off searching for good nesting cover, like old broomsedge and blackberry meadows near newer fallow ground where fescue has not encroached.

Unmated males are on the go, looking desperately for a mate. Studies have shown it's not unusual for unmated quail to move 5 to 10 miles.

New perils abound. Males on the move and females laying or sitting clutches are particularly vulnerable to mid-sized mammalian predators working dutifully to feed their young. During this period, travel corridors and abundant nesting cover are important for minimizing losses. Again, the quail that are better provided for have a greater chance of surviving.

The month of May finds most hens laying their clutches in well camouflaged ground nests constructed under a dome of dead

grasses. On average, hens lay 1 egg per day until a spring clutch of 14 to 17 eggs fills the nest bowl. This average declines for second or third nests as spring gives way to late summer. By August most clutches only have 9 or 10 eggs.

Once all eggs are layed, the hen begins "sitting" her clutch. Late May to early June is the peak time for incubation initiation. Chick development does not begin until the hen sits. This insures synchronous hatching. Sometime on the 21st or 22nd day of incubation, the chicks begin "pipping." Using their tiny "egg tooth," a protrudence on their upper beak shed 2-3 days after hatching, they begin to chip away at the large end of the egg in an amazingly precise circular fashion. All viable eggs hatch within a period of a few hours. Generally, 90 to 95 percent of the eggs hatch. Often every egg hatches. Early season nests hatch in mid to late June. Counting the 15 days for egg laying, a week for nest building, several days for finding a suitable nest site, and 23 days of incubation, hatching off a nest can require 45-50 days! Most nests, however, don't make it that long. Studies show that only about one third of in-



Lynda Richardson

(Left) A quail alone in winter's cold is a quail in peril. (Below) Clutch sitting is a dangerous time for hens. Nesting success averages 30-35 percent. (Right) A quail chick "pipping" its shell. (Far right) Once the cap is removed the chick will soon emerge. Chicks are capable of movement and foraging only hours after hatching.



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cubated nests are successful. Most of the nest failures can be attributed to skunks, opossums, raccoons, and snakes. If a clutch is lost, the hen will renest again and again until she is successful or until the breeding season ends, usually sometime in late September. Two nesting attempts are common and three are not unusual.

So what's Bob been doing all this time? While the hen is incubating, he is usually within 100 meters or so and will rendezvous with her when she takes her daily feeding break. She can be away from the eggs for several hours without harm.

The pair will meet and feed together. The bob will aggressively defend her from any encroaching male's attempts to steal her. Having witnessed this, you'll swear you've just seen two wildcats fighting in a gunny sack! If the hen fails to show, ol' bob will get nervous. He will eventually investigate the nest. If the hen doesn't return, and the clutch is o.k., he may finish the incubation himself. In the wild, males incubate 20-25 percent of all nests! Who says males are poor parents? Given the rate of predation, single parent bobwhite families are common.

Most of us are familiar with altricial bird young; the tiny, helpless songbirds that scream from their nests for food. Quail young, however, are precocial. Quail chicks are capable of moving and feeding themselves only hours after hatching. The only care that a bobwhite chick

needs during the first few weeks of life is brooding. The tiny chicks, or "Tom Thumbs" as locals call them, weigh less than a quarter-ounce at the end of their first day. Although they are highly mobile and can catch insects, they have trouble staying warm. Much of a chick's first few days is spent tucked under the feathers of an adult hen or bob getting cozy, or "brooding." Each day is a constant alternation between feeding and brooding.

And feed? Do they feed! Quail chicks are voracious insect predators. Insects comprise 90 to 95 percent of their diet during their first weeks and are critical to their rapid development, particularly their growth of feathers for flight and warmth. Providing habitat that supports an abundance of insects is extremely important for brood survival. Certain plants, particularly legumes like Kobe lespedeza and partridge pea or native weeds like ragweed, have a low toxicity to herbaceous insects, and attract numerous insects for quail chick food. Crop fields fallowed for one to three years and old fields periodically disked or burned produce these plants and insects in abundance. Not only are insects produced, but proper habitat structure is provided. Insects alone aren't enough. The chicks have to be able to get to them and do so without exposing themselves to predators and extreme summer heat. They need vegetation that's relatively open at ground level

with numerous patches of bare ground. The canopy must be closed enough to provide some shade and concealment.

When raised in quality brood cover, the tiny quarter-ounce chicks grow rapidly and are capable of short flight at two weeks, and prolonged flight at four weeks. At 15 weeks of age, they will weigh about 6 ounces and be virtually indistinguishable from adults. Imagine that parents—graduating your children from high school in less than four months!

Fall approaches. The days grow shorter. Late September finds all but a few quail finished with their reproductive effort. Chicks that have survived and prospered over summer are now forming coveys with remnant adult birds. Their reliance on insects for food decreases now to only 20 to 30 percent of their diet. Waste grain, grass, and weed seeds now make up the bulk of their fare. On farms where good quail management was practiced over summer, the coveys are well set for winter and ready to begin the cycle again. Where habitat has been poorly managed, or not managed at all, these fascinating quail are forced to move on. Their characteristic calls will be sorely missed until their homes are made suitable for their return. □

Marc Puckett is a quail habitat biologist working out of the Farmville Field Office





A Toolbox for Quail Habitat Ma

by Patty Moore

Males often perch on fences or low branches to broadcast the familiar “Bob-bob-whiite!” mating call. Providing habitat for quail during all seasons is the manager’s goal.

If you think managing for quail takes sophisticated equipment, think again. Quail habitat management is actually quite simple. Sometimes doing nothing for a period of time is better than doing something. Avoid the temptation to jump on your bush hog or mower every time you have a few spare moments. “Recreational” mowing renders many acres of good quail habitat useless, especially during the nesting season.

If you’ve got a tractor and a disc you’ve got the tools you need for managing your habitat for quail. Throw in a book of matches and your tool kit is just about complete. Knowing a quail’s year-round needs is also critical in managing quail habitat. We all know that quail need cover, they don’t live on golf courses. As landowners, we must overcome the urge to keep everything neatly mowed when we’re managing for quail.

Quail are an early succession edge species. More simply stated, they are associated with openlands

agement

Lynda Richardson

bush hog is not a quail management tool except when used in conjunction with the disc or the match. Discing and burning help increase the amount of bare ground under the vegetation's canopy, retard woody encroachment, and stimulate annual weed production. Quail need bare ground to more easily gain access to weed seeds and small insects.

Field borders provide escape and winter cover for birds. Field borders are comprised of low to intermediate woody vegetation and weeds and should be located along woodland edges, fencerows, and drainages to create a vegetative transition between cover types. Such transitions, and the diversity provided, are much more attractive to quail than the abrupt change that often occurs between field and forest. Field borders take up relatively little in total acreage. When agricultural or hay fields adjoin woodlands, little productivity is lost since crop yield is very low near forest edges. At a width of 25 feet, 1742 feet would have to fallow to leave one acre out of production.

Quail travel along the cover of field edges feeding on waste grain, weed seeds, and insects. Field borders can be established or improved using any of the following methods: 1) when next to woodlands, cut or bulldoze all trees within about 50 feet nearest the field edge and allow the remaining vegetation to grow

into shrubs or brush; 2) allow natural vegetation to encroach into the field about 25 feet and grow undisturbed until reaching the desirable stage; or 3) plant nursery grown shrubs. Once established, field borders should be maintained by periodically removing invading trees as they begin to take over or shade out low-growing plants.

Borders created by cutting back or bulldozing the forest edge have the advantage of not decreasing the amount of openland and helping to reduce shading of adjacent crops. Large trees can be marked for a firewood sale. Small trees, stumps, and laps can be used to make slash piles. The piles should be about 15 by 50 feet and no higher than 4 or 5 feet. Push a few stumps and large logs for the base and put the smaller slash on top. Do not pack the pile. The piles should not be real dense. Remember that quail need patches of bare ground for dusting. In a year or two after cutting and dozing, blackberry, pokeberry, and honeysuckle will begin to grow over the piles. Slash piles are often covey headquarters, a focal point of their home range.

Where the loss of open land is not a major concern, a border can be established by allowing naturally occurring plants to encroach into existing open edges. The establishment of field borders using this practice requires the least expense and labor. However, if a heavy sod is already

such as row crops and old field areas. Their habitat consists of a diversity of grasses, weeds, and woody vegetation, such as briars and honeysuckle. The real trick to quail habitat management is to keep the vegetation in an early successional stage.

There are two ways to manage for early succession quail habitat; strip discing and controlled burning. In general, quail habitat should be disturbed once every three years. A

(Right) Shrub field borders such as this lespedeza provide transition areas between mature forest and fields, escape cover, and often, winter food.

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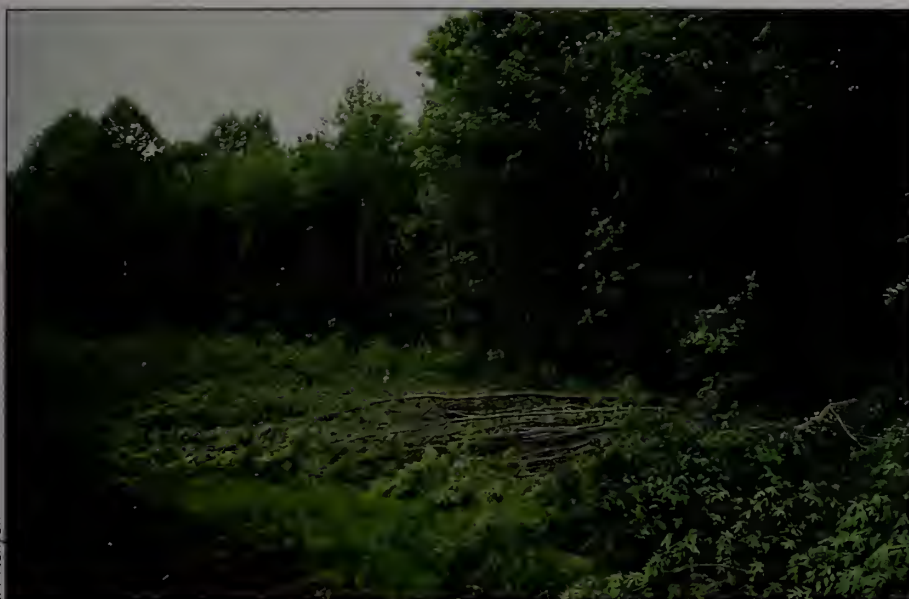
established, it should be destroyed by plowing and disking. This will help speed-up the invasion of the more desirable border plants such as blackberry, pokeberry, beggarweed, and broomstraw.

If natural borders seem undesirable (perhaps from an aesthetic standpoint), nursery grown shrubs provide an option. Shrubs can be selected that are known producers of preferred quail food. VA-70 or bi-color shrub lespedeza are hard to beat and can be maintained by bush hogging once every three years in early spring. Plum, shrub honeysuckle, and shrub dogwood are also good choices. VA-70 can be planted by seed or seedling. When planting seedlings, plant at least five rows



(Clockwise from top left) Strip disking fallow areas, a third of each field per year, is an excellent and inexpensive tool. "Setting back" timber edges is a key aspect of quail management. Cleaner is not better for quail, leave a few slash piles and unkempt odd areas. Game Department biologist prepares warm season grass drill for

*planting operations. Partridge pea (*Cassia fasciculata*) makes excellent brood rearing cover and provides winter food. (Above) Amelia County landowner Joe Anderson and a Department biologist discuss hedgerow improvement. Photos ©Dwight Dyke.*



three feet apart within and between rows. The other shrubs should be planted about four to five feet apart within and between rows. All shrubs should be planted in late winter or early spring (February or March) when they are still dormant.

Next to the shrubby strip, plow or disc a 10 to 15 foot wide strip. Allow it to remain fallow or seed it with a plant beneficial to quail. Either way, the removal of old vegetation and plant litter, and creation of new herbaceous growth will greatly improve its value for quail. When seeding, use 10 to 15 lbs. total per acre of Korean and kobe lespedeza (*not sericea*) sowed in February or



March or 10 lbs. per acre of partridge pea sowed in the spring. Maintain the planting by lightly discing once every three years in the spring.

If left fallow, disc once every three years in the spring to stimulate annual weeds such as ragweed, beggarweed, and beggar ticks which are all good native quail foods. Even more important than the seeds these plants produce are the insects associated with them. Quail chicks survive on insects for at least the first six weeks of life. They are very high in protein and promote fast growth. Discing keeps this "bugging strip" open at ground level so the bumble bee-sized chicks can move to catch insects.

Fescue is not good quail habitat. It forms a dense mat of vegetation and provides little overhead cover. The best method for eradicating fescue is to apply the herbicide Roundup in the fall. Once the fescue has been killed, native vegetation will be released. Strip discing the field is the best way to manage it for the future. Disc several 20 foot wide strips (approximately one third of the area) through the field. The following year, disc another one third of the area in strips. During the third year disc the rest. Begin the rotation over again the fourth year.

Another way to create quail nesting and brood rearing cover is to plant native warm season grasses. Warm season grasses grow in



clumps with room between the plants. They are tall growing and provide good overhead cover. Use a mixture of 2 lbs. per acre pure live seed (pls) of switchgrass, 3 lbs. per acre pls of big bluestem and 3 lbs. per acre of indiangrass. Warm season grasses should be planted in May or June at a depth of no more than one fourth inch. These grasses are best maintained through controlled burning. Burn a third of each field once every three years in the spring.

Fallowed old fields should be maintained through disking and controlled burning. About a third of each field should be disturbed every year in the spring. This creates three different stages of early succession. The birds are never without some cover using this method. An older disturbed section will provide better nesting cover whereas a newly disturbed area will be good for brood rearing.

During the summer months leave the tractor in the shed and enjoy a glass of iced tea. Mow the lawn if you feel the urge to mow. Educate your neighbors that quail require cover which is only periodically disturbed. Explain to them the reasons why *your* farm is home to bobwhites while theirs lacks birds. □

Patty Moore is a upland habitat biologist working out of the Powhatan Field Office



(Above) Educating landowners and professionals through workshops is a key management tool. (Top) when providing habitat don't forget the chicks—summer habitat is critical. (Right) A Department biologist discusses cost-share for quail management with Dairy Farmer Damon Moyer.



Lloyd Hill

Nesting and Brood Rearing Cover is Critical!

Recent studies in Florida, North Carolina, Mississippi, Iowa, and Virginia showed that bobwhite breeding behavior is more complex than previously believed. For one thing, strict monogamy, or remaining with one mate, is often not the norm. Hens would lay one clutch and leave it with a male to incubate then have another clutch that the hen would incubate. This reproductive "strategy" makes sense because there are more bobs in a population than hens. In Virginia, the average is 1.15 males per female.

As a result, the hen has no problem finding an unmated bird to breed for the second clutch. This takes advantage of the surplus of males and increases the reproductive potential of the population. Some hens that successfully incubate a clutch leave the brood with a male. This frees the hen to have another clutch, further increasing recruitment effort.

Studies conducted in North Carolina showed that:

1) Bobwhite reproductive output in intensive agriculture systems was shifted to the later breeding season

months. Though quail attempted nests in May and June, most of these nests were lost. Only 19 percent of incubated nests hatched before July 15; 54 percent of renesting attempts hatched in late July and August. Why? There was little available nesting cover early in the season. Clean farming practices forced early season birds into small sections of nesting cover, many of which were of low quality. Quail in these situations were more susceptible to nest predation. As the summer progressed, maturing soybean fields began to provide nesting, travel, and brood-rearing cover.

Though not perfect nesting cover, the soybean fields were heavily used. Most nests after mid-July were in soybeans. Where once there were small islands of marginal nesting cover, there was now a sea of nesting cover. Though there was success, much of the potential for male incubation, female double brooding and double clutching was lost because cover wasn't available until late-summer.

2) By using quail chicks imprinted on human parents, researchers could follow the chicks as they fed through various modern farm habitats. The habitats were examined for their suitability as chick rearing cover. In short, only 2 viable chick habitats existed: 1) Crop fields that

had been fallowed one to three years and 2) soybeans no-till planted into wheat stubble. In *all* other habitats examined, conventional corn, conventional soybeans, cotton, and tobacco, quail chicks failed to find the insects they needed to grow and prosper.

What does all this mean: First, habitats that produce insects and adequate brood cover are crucial for population growth, particularly in the face of increasing predator populations. Second, nesting and brood-rearing cover must be provided throughout the entire breeding season, May through September, to realize all of the bobwhite's breeding potential. □

ers for years. A few plans are fully implemented almost as written, some are implemented in small bites and some never quite make it back out of the desk. In seeking to have a greater percentage of habitat recommendations implemented, the Quail Plan offers "carrots" in the form of cost share payments to landowners who implement practices that are good for wildlife, especially quail.

Most of the cost share money has been targeted for the Best Management Practices (BMP) program of the Department of Conservation and Recreation, Division of Soil & Water Conservation. Farmers are well acquainted with the BMP program. Game Department biologists

the Wildlife Option for Buffer Strip Cropping or Vegetation Establishment For Stream Protection, they will be utilizing good wildlife plants such as orchardgrass/ladino clover, native warm season grasses, or shrubs from an approved list.

Three new practices are also offered: Field Border Plantings, Idling Land, and Fescue Conversion. These had no counterpart practice in the BMP program. Field Borders are similar to the Filter Strips but can be utilized anywhere around a field where a transition to another cover type such as pasture, cutover or hardwoods occurs. The Idle Land practice simply asks that a parcel of recently disturbed land not be disturbed for the next three years. This will produce some excellent winter foods, brood cover, and even nesting cover within those three years. The Fescue Conversion practice will allow a landowner to receive assistance to convert a fescue pasture or hay meadow to one planted to native warm season grasses.

Landowners also have a variety of other cost share programs available to them to implement quail habitat practices. The Department of Forestry has reserved the Forest Stewardship Program's Stewardship Incentive funds for quail-oriented practices for the first two months funds become available. This will help fund seeding of log decks and roads, planting woodland borders to grasses or shrubs, prescribed burning and other practices that produce fine quail habitat. Other USDA programs also provide wildlife habitat opportunities including the CP-4 Wildlife Option of the Conservation Reserve Program. Numerous practices within the new Environmental Quality Incentives Program (EQIP) can be modified to benefit quail and other wildlife. Another new USDA program is the Wildlife Habitat Incentives Program (WHIP). This will increase the ability of the USDA to assist landowners interested in wildlife habitat to improve their acreage. Details of this program should be announced in April, 1997. □



Incentives for Landowners

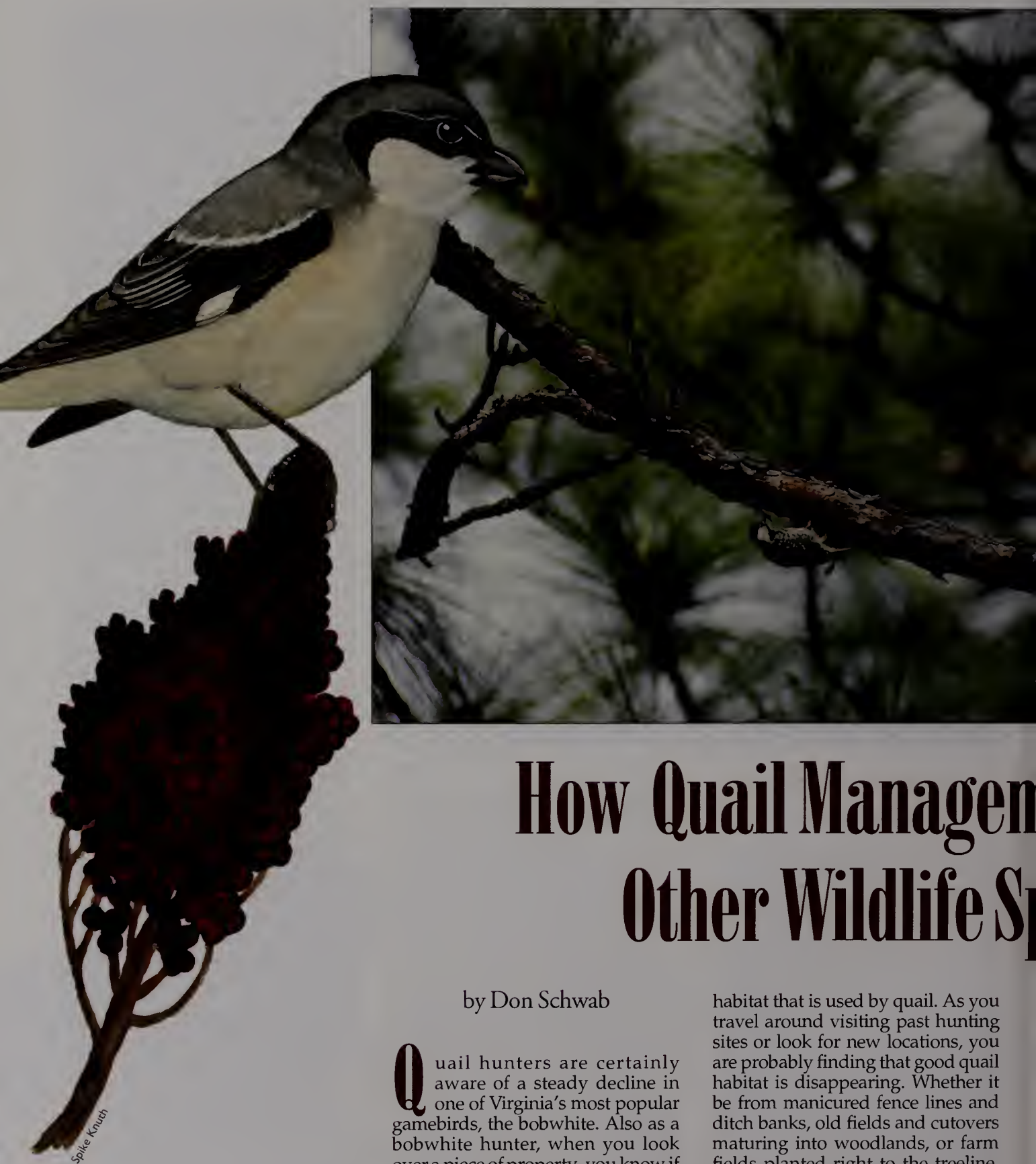
by Steve Capel

Our family was struggling up a steep mountain trail one day. Our three- and four-year-old daughters were struggling and rapidly losing interest. To keep them moving along my wife and I scanned the trail ahead for raspberry thickets. "Look, up at the next bend, some more raspberries!" and sure enough, the girls almost ran to pick the tasty raspberries. We finally made it to the top, and it was worth the trip. Sometimes you need a "carrot" to entice a person to take the next step, knowing that they will find a real reward at the end of the trail.

Wildlife biologists have been writing habitat plans for landown-

ers simply developed a set of Wildlife Options that fit into the general format of the BMP program. DCR offers a 50 percent cost share for the standard BMP practice, and the Game Department offers an additional 25 percent if the landowner chooses the Wildlife Option.

Seven Wildlife Options are available to Virginia landowners. The BMP program's Permanent Vegetative Cover practice pays a landowner to seed down an old agricultural field to permanent vegetation; most often landowners choose tall fescue. If a landowner chooses the wildlife option and plants a native warm season grass, they will receive an additional 25 percent. They can put in a filter strip using switchgrass or orchardgrass/ladino clover instead of tall fescue. Similarly if they choose



Spike Knuth

How Quail Management Other Wildlife Sp

by Don Schwab

Quail hunters are certainly aware of a steady decline in one of Virginia's most popular gamebirds, the bobwhite. Also as a bobwhite hunter, when you look over a piece of property, you know if you will likely find birds. Why? The property either has or does not have

habitat that is used by quail. As you travel around visiting past hunting sites or look for new locations, you are probably finding that good quail habitat is disappearing. Whether it be from manicured fence lines and ditch banks, old fields and cutovers maturing into woodlands, or farm fields planted right to the treeline, quail habitat is becoming scarce. As you have found in reading other ar-



Rob Simpson

ent Helps pecies

articles in this issue of *Virginia Wildlife*, much is being done to correct these deficiencies in quail habitat through cooperation of private organizations, several state government agencies, and individual landowners.

Quail habitat management promotes diversity. Many species benefit including (left to right) the loggerhead shrike, red-cockaded woodpecker, and upland sandpiper.

The northern bobwhite is a species that depends on grasslands and shrub habitats as the principal habitat type. Quail also use some woodland habitats, especially farther south, where open understory pine stands and pine savannah (a grassland type) ecosystems become important. The grassland community has never been an abundant ecosystem in Virginia, but it was more common prior to the 1970s. As we work hard to save the bobwhite through the creation and protection of habitat, a wider variety of wildlife species benefit from our work.

The cottontail rabbit has done a bit better than the bobwhite over the years, though numbers are not what they use to be. The creation of field borders, filter strips, and conversion of fescue pastures to native warm season grasses will not only help the quail but will provide habitat for the cottontail.

As a nongame biologist, most of my work is with species that are not hunted with guns, though most are pursued with camera and binocular. Many species that are facing declines similar to the bobwhite's are grassland species or open pineland savannah species. Two critters that come to mind in discussing pinelands are the southern fox squirrel and the red-cockaded

woodpecker. These two species are found in several of Virginia's southeastern coastal plain counties that are focus areas for the Quail Plan: Sussex, Southampton, Surry, and Prince George. The southern fox squirrel has declined in Virginia. Hunting seasons on this squirrel have been closed in eastern Virginia. From work that was conducted at the Tall Timbers Research Center in Florida, this squirrel does best in open pine habitats that are subject to periodic fires similar to management practices carried out on many southern quail plantations. The same management that is good for fox squirrel and bobwhite also benefits the red-cockaded woodpecker, another species that is more common on quail plantations in South Carolina, Georgia, and Florida. Virginia will hopefully restore fox squirrel numbers to huntable levels with the assistance of management directed by the quail habitat practices that are being undertaken. The red-cockaded woodpecker will benefit from quail management, especially when lands are subjected to periodic fire. In a recent article in *The Wildlife Society Bulletin* (Vol. 24(2): 337), it states "Although the primary land management goal has been to provide high quality bobwhite hunting on these lands..." the lands



Rob Simpson



Pleasing quail hunters and wildlife watchers alike.

Pine timber thinning and controlled understory burning promote the savannah-like conditions conducive to quail. In addition to benefitting quail, the southern fox squirrel (above left) photo by Terry Shankle N.C. Wildlife, loggerhead shrike (above right) photo by Rob Simpson, and Bachman's sparrow (whose nest is pictured below) photo by Bill Lea, will all prosper.

(Right) The barn owl is provided prey by maintaining open field areas. Converting fescue to warm season grass benefits quail and owl. Photo by Rob Simpson.



"... have maintained a relatively large and stable population of red-cockaded woodpeckers as a by-product..." Another bird, a small brown job, the Bachman's sparrow, shares this open pine/grassland habitat with the southern fox squirrel and the red-cockaded woodpecker. This sparrow will benefit from quail management, especially where periodic burns are associated with open pine stands.

One obvious central problem seems to arise when talking of any species that relies on grassland habitats—the loss of this grassland community. The changes in farming practices, development, and reforestation are the causes most commonly cited as reasons for bird declines including the northern bobwhite, the upland sandpiper, and the barn owl. As a quail hunter, the following bird species likely mean little to you during your fall and winter hunts. However, if you also happen to be a birdwatcher, amateur naturalist, or just interested in the wildlife species of Virginia, the pleasure of seeing some of these rarer critters make the days prior to the hunting season far more interesting when checking out the number of quail pairs or broods on your property. By the time quail season opens in November, many of the species that share the breeding habitat of the bobwhite have flown south to spend the winter. The upland sandpiper, a rare Virginia grassland breeder, flies all the way to Argentina, a country known for its large, expansive grasslands.

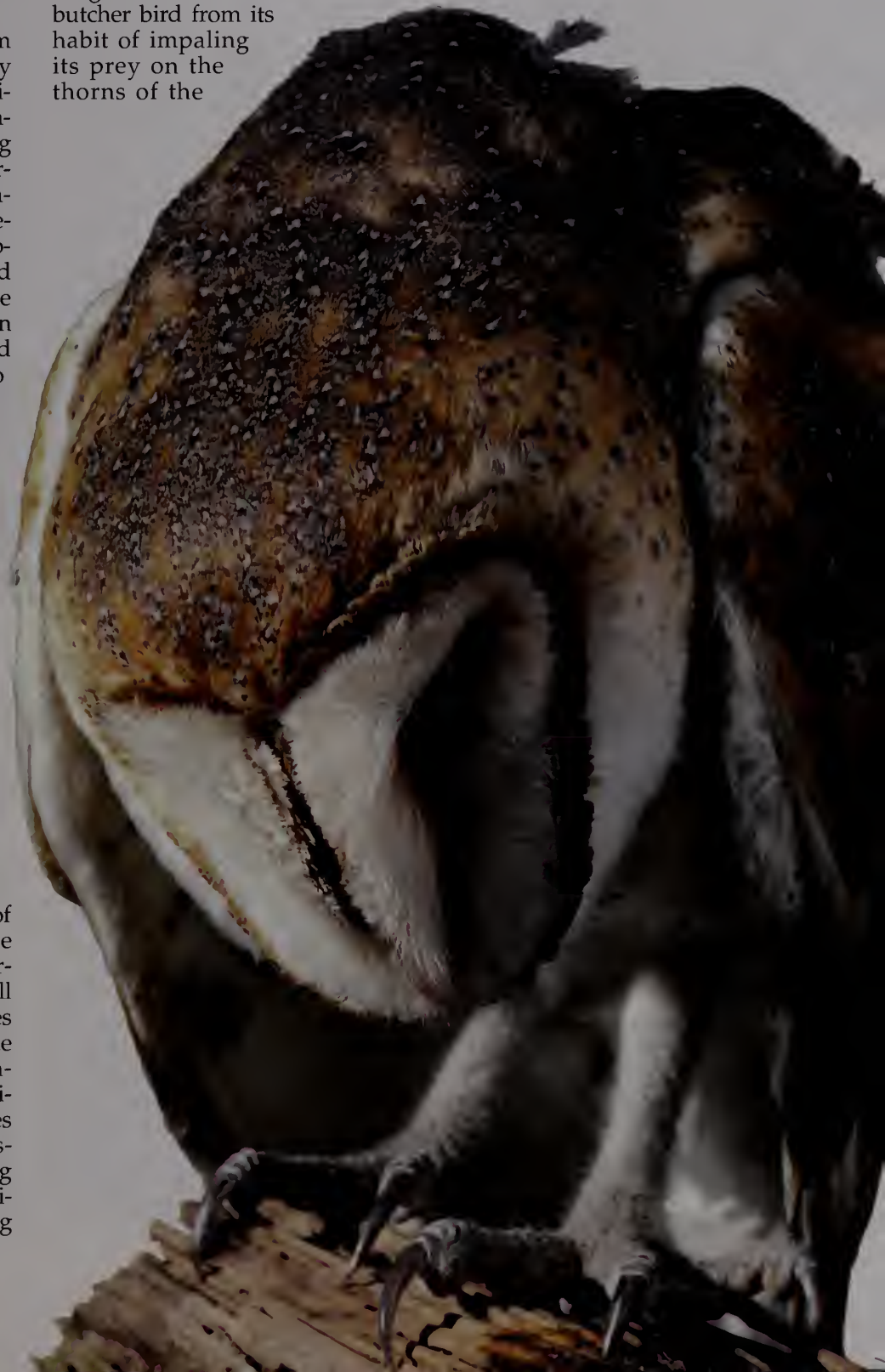
Upland sandpiper, barn owl and Henslow's sparrow all depend on open field habitats for most of their needs. Conversion of fescue pastures and establishment of permanent vegetational coverage will do much to insure that these species remain part of Virginia fauna. The management needs of the Henslow's sparrow for its breeding habitat require that: "Cyclic disturbances are necessary to maintain grasslands. Prescribed burns, mowing (haying), and grazing ..." As individuals interested in maintaining

quail habitat the preceding sounds rather familiar.

The loggerhead shrike, "the butcher bird," a species that requires shrub areas, hawthorn, and open grasslands will benefit from the establishment of field borders and hedgerows. Shrikes are mainly insect feeders, taking small mammals occasionally—not your normal songbird! It is called the butcher bird from its habit of impaling its prey on the thorns of the

hawthorn bush or on the barbs on barbed wire fence. The shrike, though once common throughout Virginia, is now found only in scattered areas of the Piedmont, and Ridge and Valley Regions. □

Don Schwab is a nongame biologist working out of the Williamsburg Office.





Lloyd Hill

We're Not an Island

"No man is an Island entire of it self, every man is a piece of the Continent, part of the main...." John Donne, 17th century English poet and clergyman who was a personal friend of Izaak Walton.

As has been the trend in the past, monies for wildlife normally and predominately come from the hunting and fishing public. The push to insure the availability of the bobwhite quail and its habitat in Virginia is being funded through hunting license sales, federal taxes on firearms and ammunition, and donations from private organizations such as Quail Unlimited.

By restoring habitats for quail, this single species management push will likely do much to ensure that open habitats will exist for a wide range of other wildlife.

As Aldo Leopold, founder of the disciplines of Wildlife Management and Ecology, in the essay "Conservation" noted, "... Only those who know the most about it can appreciate how little we know about it. The last word in ignorance is the man who says of an animal or plant: 'What good is it?' If the land mechanism as a whole is good, then every part is good, whether we understand it or not. If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering." □

Some of us may like to think we're independent. Americans have always taken pride in "going it alone." But, the fact is, with the exception of a rare few, no one really gets very far that way. Sooner or later we come to the banks of rivers that can't be crossed alone. More cooperators are needed to man the oars required to navigate difficult currents.

For many years bobwhite quail populations have declined. Marked declines in grassland nesting songbird populations paralleled the quail's decrease. As the agency with primary responsibility for Virginia's wildlife, the Virginia Department of Game and Inland Fisheries (VDGIF) began addressing these declines many years ago. It quickly became apparent that trying to swim this river alone was futile. Struggle as we might, the current of species decline swept us downriver and washed us back on the banks we began from. We needed some helping hands.

One of the first of many helping hands was formed in 1981. The bobwhite's decline was not limited to Virginia. The bobwhite declined throughout most of its range that encompasses 39 states. In response to the decline, private citizens banded together across the nation to form Quail Unlimited (QU), a private organization committed to reversing the decline.

In 1995 alone, Quail Unlimited chapters contributed \$792,000 for ac-



tivities aimed at restoring quail populations. These included seed purchases, standing crop purchases, chapter planting projects, equipment purchases, landowner contacts, and youth programs. VDGIF and Quail Unlimited have worked hand in hand since the organizations inception. Our hats are off to Quail Unlimited and their dedicated members for 15 years of working in the quail trenches.

In addition to Quail Unlimited, many agencies have sent our Department helping hands. The Virginia Department of Forestry helps with the writing of Forest Stewardship plans and provides equipment and technical assistance to landowners interested in controlled burning. The Natural Resources Conservation Service (formally Soil Conservation Service) oversees fed-



Rob Simpson

eral conservation programs and helps VDGIF by allowing our biologists input into guidelines for implementation of those programs. The Consolidated Farm Services Agency (formally Agricultural Stabilization and Conservation Service) oversees the Conservation Reserve Program and seeks VDGIF's advice on wildlife beneficial practices. The Virginia Department of Transportation works with VDGIF biologists in designing roadside plantings conducive to quail and other wildlife. The U.S. Fish and Wildlife Service lends their hand by managing for early successional species on Virginia's federally owned lands. Virginia's County Extension Service agents contact thousands of landowners annually and work closely with VDGIF biologists to promote quail management. And,

many of our state's power companies have welcomed VDGIF's input on wildlife friendly powerline rights-of-way maintenance.

One fine example of agency cooperation, and mutual helping hands, is the alliance between the Virginia Department of Game and Inland Fisheries and the Department of Conservation and Recreation (DCR). For many years, the DCR's Soil and Water Conservation programs have safeguarded our natural resources on agricultural lands. Though primarily directed at soil and water conservation, wildlife was always a concern. Recently, VDGIF biologists and Soil and Water Conservation District representatives worked together to develop cost-share practices aimed at enhancing the farm wildlife habitat. The Virginia Department of Game

and Inland Fisheries funds enhancement projects through the DCR Soil and Water Conservation District Best Management Practices program. By working together, our agencies are able to offer cost-share in areas where none has been available for many years. Thanks to DCR for helping us make wildlife cost-share a reality.

An often overlooked aspect of wildlife extension is the importance of sound research. Management recommendations based on poor research, or no research at all can lead to failure of outreach programs and a decline in the public's confidence in an agency. Our Department owes a big thank you to all the fine research institutions in Virginia who have contributed to our management knowledge. Particular thanks are due Virginia Polytechnic Institute and State University (Virginia Tech) and Dr. Willy Reay and Dr. Dale Wolf for extensive research into the establishment and management of native warm season grasses. We have no hesitations making recommendations based on their research.

Batting clean-up in our thank you line-up is the huge thanks we owe Virginia's private landowners. The Virginia Department of Game and Inland Fisheries' programs and programs of all the aforementioned agencies and organizations would never have a chance if not for the dedicated efforts of Virginia's private citizens. We could cross few "rivers" without their support. From those allowing us to conduct research on their lands to those implementing habitat projects, our cooperating landowners play a critical role in the conservation of Virginia's natural resources. Thanks folks. Keep up the valued efforts!

No, VDGIF is not an island. Only through working together can we sew the sail and build the boat that will carry the Virginia Bobwhite Quail Management Plan to reality and insure conservation of all our children's and grandchildren's natural resources. □

Crooked Creek WMA— Rich in Flora and Fauna

by Spike Knuth

Crooked Creek Wildlife Management Area (WMA), a 1,796-acre area in Carroll County near Woodlawn and Galax, was originally obtained to provide trout fishing opportunities for the public. It has 3.5 miles of stream that is stocked plus 2.8 miles of native brook trout water. In addition to its trout fishing, Crooked Creek WMA is rich in flora and fauna, and Department biologists are working to make it even more attractive to wildlife by enhancing and diversifying its habitat for wildlife.

Habitat is "home" for wildlife. It provides shelter; breeding places, places for wildlife to grow up, as well as food and water. Wildlife Biologist Danny Harrington said that initially much of the area was in fields and pastureland with only a smattering of forest land. Work is presently underway to maintain the best of those habitat types and to improve others.

For example, 3,500 new trees have been planted in key areas, most of them hard and soft-mast producing trees such as oak, chiquapin, apple, persimmon, buttonbush, and silky dogwood. Harrington plans to add another 1,000 mast-producing trees through next year. "This will greatly increase food production for wildlife on the area," Harrington said. In addition, pines are being planted as road screens.

Some old field management is also occurring, meaning that some of the older field habitats will be maintained in their present condition through prescribed burns and mowing. Some cedar will be planted in these fields, creating a habitat type that is favored by loggerhead shrikes, a rare species in Virginia.

In these and other fields a fescue control program will be undertaken through mowing, spraying, and

prescribed burns. This activity will be followed up by the planting of native warm season grasses. Har-



©Dwight Dyke



©Dwight Dyke

rington said that there will be an effort to control most exotic plants. This conversion to warm season grasses will increase year to year. Firebreak borders of clover and orchard grass will be planted in 12-foot wide strips. These serve as a fire control tool as well as providing brooding areas for turkey and quail. They also serve as feeding areas for deer and feeding and nesting areas for songbirds.

Another plant used by habitat managers is VA70 lespedeza. This plant grows with thick, bushy tops with seeds that hang on the plant through the winter, but is relatively open underneath. In effect, they provide an umbrella-like canopy above, but open, easily-traveled areas underneath. Plantings of this VA70 is especially attractive to quail. In another series of fields, warm season grasses, such as switchgrass and partridge pea—a legume—will be planted. Some 25 acres of new fields will be created during 1996-97.

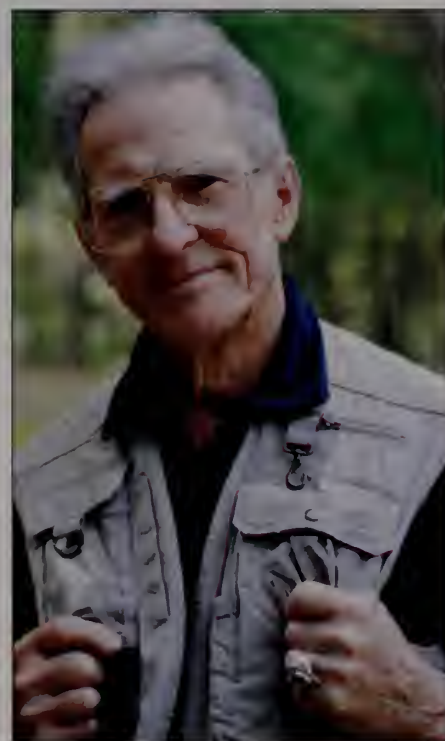
Harrington said that a four-acre dove field was established for this past hunting season and was planted to buckwheat, black oil sunflower, and brown top millet. Present plans call for the establishment of three additional dove fields for the 1997 season, then to use them on a

two-years-on and one-year-on rotation.

Loggerhead shrikes are not the only nongame specie getting special attention. Some 50 bluebird nesting boxes have been erected in a variety of habitat types. These attract not just bluebirds, but chickadees, titmice, house and carolina wrens, and possibly Bewick's wrens, another rare and endangered specie. In addition, three barn owl nesting boxes have been erected in two old barns and an old brick silo on the area. "They were put up a little late for 1996, but hopefully next season they'll be used," Harrington said.

Crooked Creek's unique habitats have a variety of other wildlife. It's an excellent area for birdwatching. Species like indigo bunting, goldfinch, yellowthroats, towhees, and many more are commonly seen here. The area also has a wealth of wildflowers and other plants, and even a special butterfly field is planned for the future. Biologists will also be keeping a special lookout for bog turtles and upland sandpipers, two species of special concern. Trails are in the process of being developed on the area too. New signage will guide users around the area. Ultimately a kiosk explaining some of the features of the area will be erected as well.

The creek is stocked with trout six nights a week, except on Sunday unless a Monday holiday follows. This is a fee fishing area requiring a daily permit at a cost of \$4.00 in addition to the state fishing license. The fee fishing season runs from the third Saturday in March through Labor Day. Fishing hours during the fee-fishing season from the third Saturday in March to April 30, is 7:00 a.m. to 6:00 p.m.; then from May 1 to Labor Day they are 6:30 a.m. to 7:00 p.m. Outside of the fee-fishing season, both a state fishing license and a trout license are required to fish. The area is located about four miles east of Galax. To access the area, from U.S. 58 at Woodlawn, take Route 620 south for four miles. A concession sells licenses, permits, basic tackle and bait, food and beverages. □



To the Editor:

Dear Virginia Wildlife,

After strolling through every page of your January issue of *Virginia Wildlife*, I'm compelled to say: "Beautiful issue. In all ways for every trout devotee."

Bob Gooch's wintertime trout article told all the essentials for frigid angling. Larry Mohn's Trout Guide, and the species rundowns were right on – the stream regs – and programs – really covered trout like a finely woven creel.

And for dessert, we're trying Joan Cone's Apple-Cranberry-Date pie recipe. Congrats on a very informative issue!

Uncle Homer
Angling Editor
Sports Afield Magazine



Photo Tips

By Lynda Richardson

Photographing Wild and Wonderful Virginia

Let's try something new! For the past four years, *Virginia Wildlife* magazine has held the "Your Magazine Assignment" photography contests and they have been very popular. But, as an experiment, we decided to try something different.

This year's contest theme is "Wild and Wonderful Virginia." We would like readers to select images from their files or simply shoot new pictures to compete for prizes in three categories. (A final decision has not yet been made on prizes but it will be announced in an up-coming "Photo Tips" column.)

The categories are: "Wonderful Wildlife," "Wild and Wonderful Scenery," and "Enjoying Wild Virginia."

1. "Wonderful Wildlife"

Photographs submitted to this category can be pictures of any native wild animal such as insects, fish, amphibians, reptiles, birds, and mammals. If an animal is photographed in a captive situation, this must be stated on the delivery memo. Do not submit photographs of domestic animals.

2. "Wild and Wonderful Scenery"

Photographs submitted to this category can be pictures of any beautiful landscape photograph taken in Virginia. Emphasis should be on scenes without buildings, man-made structures or domestic animals.

3. "Enjoying Wild Virginia"

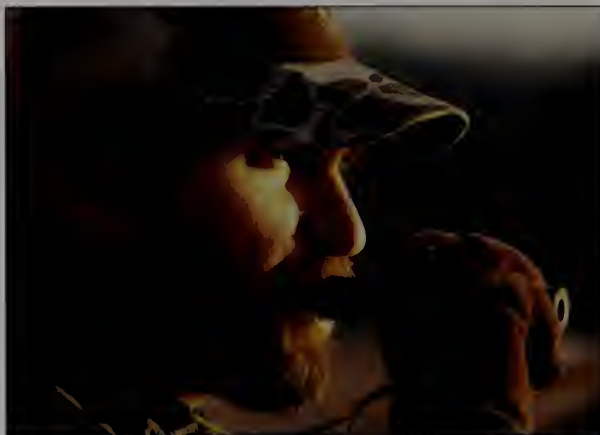
Photographs submitted to this category should show people enjoying the outdoors. Whether biking, camping, fishing, kayaking, hiking, hunting, skiing, or rock climbing we want to see who is enjoying the great outdoors of Virginia.

The following are the rules for this year's new contest:

1. Each photographer may enter up to three slides per category.

2. All photographs submitted must have been taken in Virginia within the past five years.

3. Photographs may be submitted in any slide/transparency format such as 35mm, 2 1/4, or 4 X 5. If you don't want to send the originals, reproduction quality duplicate slides are acceptable. Please mark all slides to indicate if they are duplicates or originals and note this on your delivery memo.



"Enjoying Wild Virginia," a hunter calls ducks from his blind on the Chickahominy River. Photo by Lynda Richardson.

4. Slides should be submitted in clear plastic storage sheets for ease of handling by the judges.

5. All contest entries must be listed on a piece of paper or "delivery memo" with your name, address, and phone number. When listing each photograph, please state which category you are entering and if you know the lens used, exposure, type of film, filters or any other details or stories that you think may be of interest. Don't forget to make a copy of the delivery memo for yourself.

6. All submissions must be accompanied by a self-addressed, stamped envelope (SASE) for the return of your slides. Submissions without SASEs will not be returned! If return is by Fed Ex (or other courier), please include a form already filled in with your name, address, phone and account number. Do not send money, checks or loose stamps.

7. Deadline for this contest is October 3, 1997 and submissions must be postmarked by October 3, 1997. All submissions, except the winning entries, will be mailed back by December 31, 1997. Winning entries will appear in the January 1998 issue of *Virginia Wildlife* magazine and will be returned by March 30, 1998.

8. Mail your contest entries to: 1997 Photo Tips Contest, c/o *Virginia Wildlife* Magazine, P.O. Box 11104, Richmond, VA., 23230-1104. Courier address is: 1997 Photo Tips Contest, c/o *Virginia Wildlife* Magazine, 4010 W. Broad Street, Richmond, Va., 23230. I would recommend sending (and returning) your photographs by certified or registered mail or by a courier which uses a tracking number to locate lost packages.

9. Neither *Virginia Wildlife* magazine, Lynda Richardson, or any other assigned contest judge will be responsible for the receipt of damaged slides or the return of slides not accompanied by a self-addressed stamped envelope.

Now go out and have a great time "Photographing Wild and Wonderful Virginia." Good luck! I look forward to seeing what you come up with. □

March Afield

by Jack Randolph

When March does its lion and lamb thing it is one of those great natural acts that reaffirms my faith. When those cold, strong winds of early March make you turn up your collar and pull down your ear flaps, these same winds are supercharging once ice-bound waters with much needed oxygen to give life beneath the surface a wake-up call. Once again we learn, in nature, nothing is wasted. Not even wind.

One of the most memorable fishing trips I ever had was on March 4 in a pounding, bone-chilling rain on the Chickahominy. We were anchored on a deep hole near Diascund Creek and we caught white perch, punctuated with striped bass, right and left. I remember a pair of brindle-colored hounds with brass-studded collars. They sat on the bank and whined, begging us to do something to get them out of the rain. Finally, we relented. We picked up the dogs and carried them a couple miles upriver to Lacy Allen's Camp.

White perch come early to the Chickahominy where minnows are the bait of choice. It is much later in the month when they assemble in the Rappahannock River within the city limits of Fredericksburg where they prefer to dine on bloodworms.

Once upon a time the Mattaponi and Pamunkey rivers were the yellow perch headquarters of Virginia. For some inexplicable reason the yellow perch fishing on these rivers isn't what it used to be. It appears that the Chickahominy River has usurped the title as the yellow perch capital of the state, at least as far as the spring run is concerned. In recent years this fish has become a year-round fish in such lakes as Lake Prince, Little Creek Reservoir in Toano, and Chickahominy Lake.

About the time the perch commence their runs up the tidal streams the suckers will start their spawning runs inland. Many like to dip net them while others prefer to fish for them with worm-baited hooks and lines.

In anticipation of the return of the songbirds of spring and summer some folks consider March the time to clean their bird feeders with a solution of bleach and water. Cleaning bird feeders takes on an added emphasis this year because contaminated bird feeders are highly suspect in the transmission of conjunctivitis, a disease fatal to house finches. Recently, it has also been discovered that goldfinches and downy woodpeckers are also susceptible to this fatal disease.



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Those of us who are excited about events that take place among the stars and planets will not wish to miss the solar eclipse that occurs on the eighth of the month.

Of course, bass fishermen consider March and April to be the prime time of the year to catch a super-size bass, possibly a state record breaker. Briery Creek Lake, which has produced bass that have missed the 16 1/4-pound state record by ounces, is considered most likely to produce the next record, but we can never discount tiny Lake Conner which produced the existing record.

March is a good month for big river catfish. Cats topping 50 pounds are a possibility this month at such locations as the James from the Pony Pasture to Dutch Gap and to the lower reaches of the tidal Appomattox and Swift Creek. The Rappahannock above Port Royal may also be productive. The most popular bait is fillets of gizzard shad, but as the herring start to move up the rivers in the waning days of the month they should be prime bait for these big blue catfish.

Although many of us look for shad and herring to run up the rivers this month, this is an exception rather than the rule. These runs come on the very backedge of March with their main effect coming in April.

For the first time in memory we have a waterfowl season in March. Snow geese are legal game until March 10. Unfortunately, hunting opportunities for these plentiful white geese are limited to Back Bay and the Chincoteague area. March 10 is also the closing day for raccoon and opossum. Crow hunters are active during the first part of the month, getting in their last shots before the season closes March 15.

March is a tricky month. It can be the last month of winter or the first month of spring. Or it can be a little of both. How March behaves has a bearing upon the months that follow. If March comes in warm and gentle-like, we will see the spring green-up come early. This will provide needed nutrients to many forms of wildlife. Turkeys, for example, may become more active earlier if March brings green grasses. If March is bleak and cold, and the spring weather deferred until April look for the spring spawning activity and turkey gobbling to be a little later.

Although March can assume many forms it remains in our mind's eye as the first month of spring, rather than the last one of winter. □

The Tasty Yellow Perch

Every spring yellow perch make a spawning run up many rivers entering Chesapeake Bay. To anglers, perch are not noted for their fighting ability. They do provide fishermen, though, with a lot of action and a pan full of delicious fillets.

Fishing for yellow perch is best during the winter months and in the spring when they are spawning close to shore. Perch will take all natural baits and some artificial ones such as flies, jigs, and small spinners.

Menu

Baked Cream Cheese Appetizer

Creole of Yellow Perch

Fresh Orange Carrots and Broccoli

Hot Fudge Pudding Cake

Baked Cream Cheese Appetizer

- 1 can (4 ounces) refrigerated crescent dinner rolls
- 1/2 teaspoon dried whole dillweed
- 1 package (8 ounces) cream cheese
- 1 egg yolk beaten

Preheat oven to 350°. Unroll dough on a lightly floured surface; press seams together to form a 12 x 4-inch rectangle. Sprinkle and gently press dillweed onto top of cream cheese. Place cream cheese, dillweed side down, in center of dough. Bring up sides of dough snugly around cheese, pinching to seal. Place seam side down on a lightly greased baking sheet. Brush with egg yolk. Bake at 350° for 20 to 22 minutes. Serve warm with crackers. Makes 16 appetizers.

Creole of Yellow Perch

- 10 to 12 yellow perch
- 1/2 cup chopped onion

- 1/2 cup chopped celery
- 1/2 cup chopped yellow pepper
- 1 can (16 ounces) tomatoes, chopped
- 2 tablespoons margarine or butter
- 3 tablespoons flour
- Salt to taste
- 1/4 teaspoon each of basil and thyme
- 1 teaspoon chili powder
- 1/2 teaspoon garlic powder
- 3 tablespoons soy sauce
- Hot steamed rice (6 servings)

Place fish on a microwave platter and position them head, tail, head, tail. Cover platter with plastic wrap, folding back one corner. Microwave on HIGH for 3 minutes. Then take a fork and remove bones and skin from the fish. In a small microwave bowl, microwave onion, celery, and pepper on HIGH for 3 minutes. In a large saucepan, add the microwave vegetables and the remaining ingredients, except rice, and simmer on a conventional stove for 15 minutes. In a large skillet, sauté fish in margarine or butter and add to creole sauce just prior to serving. Serve over hot, steamed rice. Serves 6.

Fresh Orange Carrots and Broccoli

- 2 cups broccoli flowerets
- 1 1/2 cups bias-sliced carrots
- 1/2 cup low sodium chicken broth
- Juice of 2 navel oranges (1/2 cup)
- 2 teaspoons cornstarch
- 1 green onion, sliced
- 1/2 teaspoon fines herbs or dried basil, crushed
- 1/2 teaspoon sugar
- Salt and pepper to taste
- 1 navel orange, peeled, chopped

Place broccoli and carrots in a steamer basket; place in a saucepan

filled with 1-inch water. Bring water to boiling; cover and steam 8 to 10 minutes or until vegetables are tender. Remove steamer basket from pan and discard liquid. Keep vegetables warm. In same pan, stir together broth and juice, add cornstarch and stir until it is dissolved. Stir in onion, fines herbs, sugar, salt, and pepper. Bring mixture to boiling and reduce heat and simmer until sauce thickens and bubbles. Cook 1 minute more. Stir in chopped orange and return vegetables to pan. Toss gently with sauce and serve immediately. Makes 5 to 6 servings.

Hot Fudge Pudding Cake

- 1 cup buttermilk baking mix
- 1 cup sugar
- 3 tablespoons plus 1/3 cup unsweetened cocoa powder
- 1 1/2 cup milk
- 1 teaspoon vanilla
- 1 2/3 cups hot tap water
- Confectioners' sugar (optional)

Mix buttermilk baking mix, 1/2 sugar and 3 tablespoons cocoa in a greased 8-inch square baking dish. Stir in milk and vanilla until well blended. Sprinkle evenly with remaining 1/3 cup cocoa and 1/2 cup sugar. Pour on water. Bake in a preheated 350° oven for 40 minutes or until top is firm. Dust with confectioners' sugar. Serve at once in dessert bowls with sauce spooned over cake. Makes 6 servings.

Joan Cone's award winning game cooking course can be accessed on the Internet at: <http://www.wmbg.com/mindstore/cook>

by Nancy Hugo

Habitat

Trout Lily

Wildflowers that bloom even before the soil warms and the trees leaf out are often the most appreciated, and trout lily is no exception.

If you've found places in the woods where trout lilies bloom—and most Virginia counties have them—you'll want to visit them every year around this time because there is something reassuring about knowing the trout lilies are blooming even when March turns mean. These delicate wildflowers brave the cold and the wind to decorate the forest floor with their 6-inch mottled leaves and pale yellow, lily-like blooms. Moist woods and thickets—often near streams—are where you'll typically find them, and you may notice colonies of their pale green leaves splotched with purplish brown before you see the flowers.

Much that there is to know about this wildflower (*Erythronium americanum*) is communicated through its common names. The reference to trout in the "trout lily" name refers to the mottling on the plant's leaves—coloring that resembles the mottled markings on a brook trout. "Fawn lily," another of the plant's common names, refers to the leaves, too. Some say the name derives from the similarity between the mottling on the leaves and the mottling of a fawn's coat; others argue it's the way the plant's two leaves look—upright and alert like fawn's ears—that accounts for the name. A third name for the plant—adder's tongue—also communicates something about the way the plant looks. Some say it's the flower's protruding stamens that have led to this name, others say it's the sharp, purplish points of the plant's emerging leaves that look like snake's tongues,

but whatever the referent, the name reveals a level of familiarity with this wildflower that's impressive.

The name that will really get you up close and personal with the trout lily, however, is dogtooth violet. This is one of the most popular common names for the plant, but it's also the one least well-understood. Most everybody looks for the origin of the name in the plant's flower—what could it be about this flower that resembles a dog's tooth?—but the connection isn't in the flower, it's underground. Trout lily (or dogtooth

the green seed pods that follow the flowers.

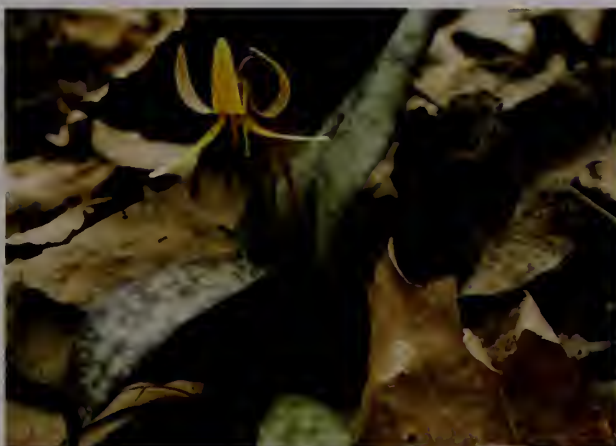
Nobody seems to know, by the way, where the "violet" part of the dogtooth violet name came from. The flowers neither resemble violets nor are they members of the violet clan (they are true lilies), and the only association I can see with violets is that they tend to colonize and bloom in the woods as violets do.

Two other common names for trout lilies are amber lily and yellow snowdrop. Amber lily obviously refers to the flowers' color and shape, although I might mention that when you are looking for these flowers the first time, you might want to look for stars instead of lily-like trumpets because the flower's petals and sepals are reflexed in a way that makes them look star-like. The flowers are creamy-yellow streaked with brown or maroon on the outside and a warm buttery-yellow on the inside. There's also a white trout lily, *Erythronium albidum*, but it's rare in Virginia.

The name yellow snowdrop was applied to these wildflowers by European settlers who saw in them a symbolic resemblance to the white snowdrop, another early-bloomer.

If you'd like to enjoy these native wildflowers in your woods and don't have them, you can order them from a wildflower nursery that propagates the plants. Echo Gardens in Decatur, Georgia (404-294-6468) is one source. Whatever you do, don't remove plants from the wild even if you find a large colony of them, because what looks like plants free for the taking to you may be someone else's long-awaited sign of spring. □

Nancy Hugo writes "Earth Works" for the Richmond Times-Dispatch.



Nancy R. Hugo

violet) grows from a fleshy, white underground bulb that resembles a canine tooth. I almost hate to say so, because I don't want to promote digging them up, but not only are these bulbs interesting to look at, they are edible. American Indians and settlers reportedly once stored them in root cellars and ate them as winter food (they used trout lily leaves in soups and stews, too), but trout lily bulbs are neither big enough nor tasty enough (they taste a little like bamboo shoots) that I'd want to make a habit of sacrificing the flowers for the bulbs. You might want to watch, however, to see what animals take advantage of the bulbs' food value. I've read that bears eat dogtooth violet bulbs and that deer eat



by Col. William Antozzi, Boating Safety Officer

Boating Education

The sky may be gray, the chill wind whistles through the bare trees and the TV programs are not all that attractive. This is the time to think about spring and the beginning of the boating season. It is also the time to get ready by improvement of boating knowledge and skills. Boating basic skills and seamanship courses are taught by volunteers who are well qualified professionals. The courses are available throughout Virginia and information on dates and location may be obtained by reaching any of the Virginia Department of Game and Inland Fisheries boating education coordinators listed below:

Jim Richardson
9128 Huron Avenue
Richmond, VA 23294
(804) 270-4580

Commodore E. L. Tucker
610 Allen Mill Road
Yorktown, VA 23692
(757) 898-8151

Paul Howell
4408 Kirkwood Drive, S.W.
Roanoke, VA 24018
(540) 774-2619

Bill Perry
Route 2, Box 268
Colburn, VA 24230
(540) 835-9617

Jim Crosby
1278 Crozet Avenue
Crozet, VA 22932
(804) 823-2277

Jerry Mittlebach
7811 Huntsman Blvd.
Springfield, VA 22153
(703) 866-5853

The state course is a six lesson course, with an additional two hours for review and an exam. It is

designed to teach boat handling, navigational rules, navigation aids, and to introduce legal and safe practices to boaters. The information is useful to both owner/operators and passengers who are just along for the fun. Knowing safe boating principles will prevent trouble as well as aid boaters in getting out of trouble.

Boat operators are responsible for the safety of their boats, passengers, and any damage the boat or its wake may cause. Ignorance of proper boat operation laws and rules related to boating is no excuse in the event of serious problems or accidents.

The course content recognizes the facts that most fatal accidents are caused by falls overboard and non-fatal accidents are collisions with other boats and fixed objects. Although fires and explosions occur less frequently, they account for a

high percentage of property loss.

The course is taught by experienced, state certified instructors and proof of successful completion is accepted by most insurance companies as qualification for insurance premium reduction.

There is no cost for instruction, textbooks or other course materials. The course text is a basic book and does not cover all aspects of boating. More advanced courses are provided by the United States Coast Guard Auxiliary and the United States Power Squadrons.

For general information on courses call Boat U. S. at the toll free number 1-800-245-BOAT. For specific information write the Department of Game and Inland Fisheries, P. O. Box 11104, Boating & Resource Education, Richmond, Virginia 23230-1104. □

Course Content

The six hour course covers the subject matter listed below:

I. All About Boats

Choosing the Right Boat
Classification
Basic Boat Hull
Watercraft
Motors

II. Legal Requirements

Registration
Equipment Requirements

III. Rules of the Road

Basic Safety Regulations
Rules of the Road
Navigational Aids

IV. Getting Underway

Preparation
Knots
Getting Underway
Maintenance
Cruising
Courtesty
Docking

Security
Anchoring
Storage

V. Accidents

Accidents
Visual Distress Signals
Emergencies
Accident Reporting
Aquatic Safety
Fire on Board
Alcohol Safety
First Aid

VI. Special Topics

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Water Sports
White Water
Dams
Sailboats
Locks
Glossary
Trailering

Virginia Wildlife Magazine

*Your Guide to Virginia's
Great Outdoors*

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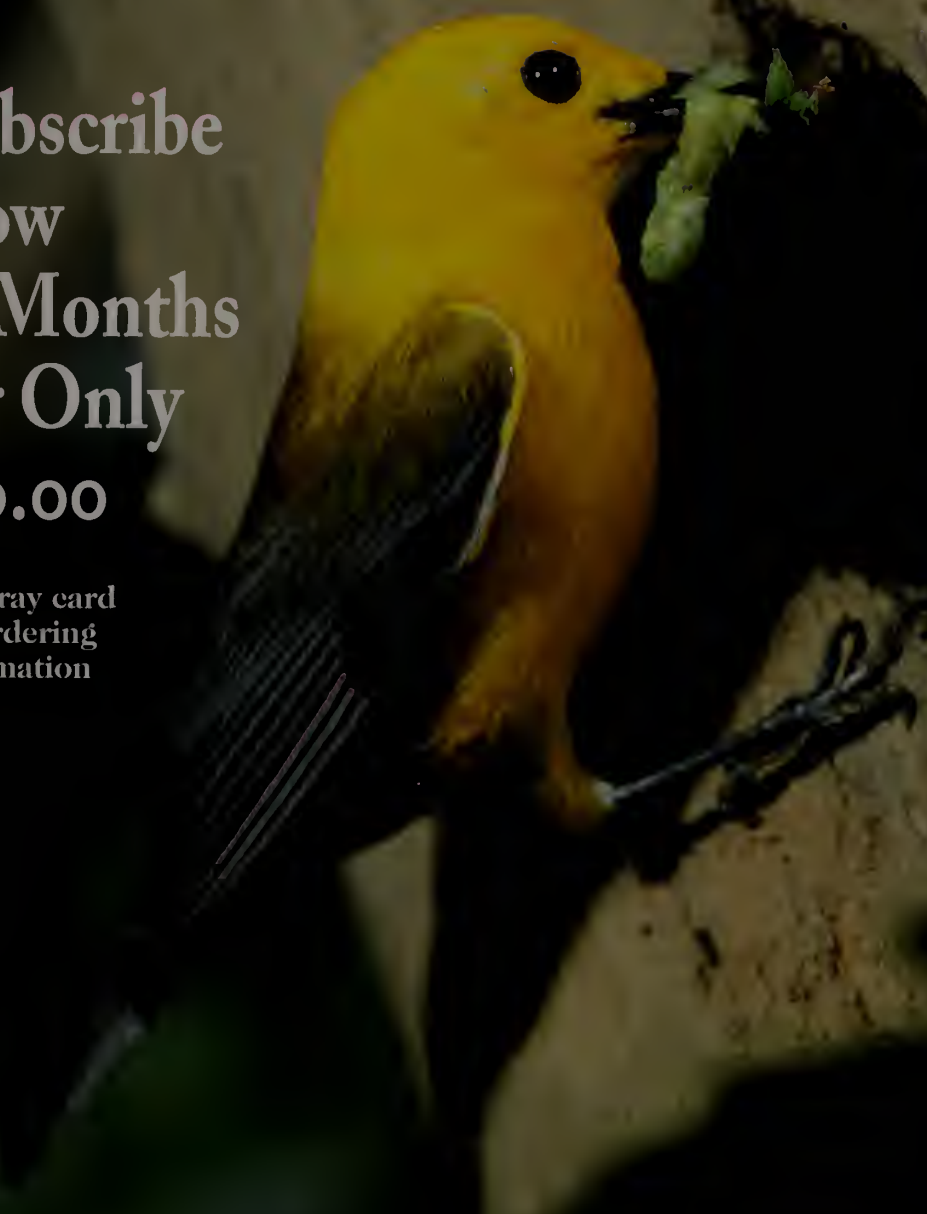
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information

Remember the Nongame Wildlife Tax Checkoff

All funds for Virginia's Nongame Wildlife Program are generated by donations and a tax checkoff on the Virginia State Income Tax Form. If you are due a tax refund from the Commonwealth of Virginia, you can take advantage of this opportunity to contribute to nongame wildlife management and conservation by simply marking your tax return in the appropriate place.

When you do this, you are supporting the essential research and management of Virginia's native birds, fishes, and other nongame animals, that make Virginia's outdoors a unique place.

Remember the Nongame Wildlife Tax Checkoff as you do your Virginia state taxes this year, and support Virginia's Nongame Wildlife Program.







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